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X-S

A MONOGRAPH
OF THE
JACAMARS AND PUFF-BIRDS,
OR
FAMILIES GALBULIDÆ AND BUCCONIDÆ.

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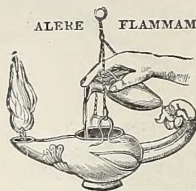
BY
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BENEDICITE OMNES VOLUCRES CÆLI DOMINUM.

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ALERE FLAMMAM.



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In Memoriam

VIRI PRÆSTANTISSIMI

HUGONIS EDVINI STRICKLAND,

RERUM ORNITHOLOGICARUM PERITISSIMI,

MAGISTRI DILECTISSIMI,

MORTE IMMATURA ABREPTI,

HOC OPUS

GRATO ANIMO

DISCIPULUS

DICAT.

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PREFACE.

THE Jacamars and Puff-birds formed the subject of some of my earliest studies in Ornithology. Of the former of these families I published a Synopsis in 1852, of the latter in 1856. Since those dates I have not failed to add to my series of examples of both these groups whenever the opportunity has presented itself. Assisted by the additional materials thus acquired, and by the excellent collection of the birds of both these groups in the cabinets of my friends Salvin and Godman (which has been placed unreservedly at my service), it has been a great pleasure to me to go over former ground and to do my best to give a complete account of what is as yet known of the Jacamars and Puff-birds. I trust that the work now completed will be found worthy to rank along with other similar well-known Monographs that have been lately issued, and to find a place next to them on the book-shelves of my brother Naturalists.

I have to acknowledge the cordial assistance received from many friends during the progress of this work, and especially the kind aid rendered to me by Mr. W. A. Forbes, who has provided me with some most valuable notes on the anatomy and osteology of the birds of these two groups.

P. L. SCLATER.

July 1st, 1882.

INTRODUCTION.

I. *General Remarks on the Jacamars and Puff-birds.*

ACCORDING to the scheme proposed in my recent article "On the present State of the Systema Avium"* the Jacamars and Puff-birds form two closely allied families of the Zygodactylous Picariæ, which, although quite well distinguished from one another, have no intermediate forms, and must consequently be placed next together in the series. The remaining three families which together with the Galbulidæ and Bucconidæ constitute the group of Zygodactylous Picariæ are the Rhamphastidæ, Capitonidæ, and Indicatoridæ. But the three last-mentioned groups are at once distinguishable from the Jacamars and Puff-birds by the tufted oil-gland, the absence of cæca, the imperfect clavicles and other characters, and constitute quite a separate section.

At the same time it must be allowed that this position of the two families now treated of is not likely to be a permanent one; and Mr. Forbes has favoured me with the following remarks upon what he believes to be their more rational position in the system:—

"As regards the affinities of the Jacamars, the absence of the *ambiens* and accessory femoro-caudal muscles, the nude oil-gland and large cæca, and the pterylosis show that it is only amongst the Passeriformes† of Garrod that they can be placed. Of these the Passeres proper and the Caprimulgidæ and their allies (including the Owls if they are really related) can be at once excluded from further consideration, their differential characters being too well marked to need notice here. The Trogonidæ, Meropidæ, Coraciidæ and Leptosomatidæ remain; and it is amongst these that the nearest living allies of the Jacamars and consequently Puff-birds must be found. The Trogonidæ differ markedly in their peculiar feet (the second instead of the fourth digit being reversed), in the non-desmognathous skull, in the very passerine pterylosis, in having only one carotid artery‡, and in lacking the *expansor secundariorum* muscle.

"From the three remaining groups (Meropidæ, Coraciidæ, and Leptosomatidæ) the Jacamars and Puff-birds are clearly separable by the structure of the feet and by the distribution of the plantar tendons. Nevertheless it is with these three groups that, in most respects, the Jacamars and Puff-birds have close affinities. Neglecting the feet, the pterylographic differences are perhaps the most evident, the Leptosomatidæ having in common with the Coraciidæ a well-marked interscapular bifurcation of the dorsal tract not present in any other of these forms. The Meropidæ lack the internal 'gular' branch to the pectoral tract of the Galbulidæ, and differ still more markedly in the disposition of their tracts from the Bucconidæ.

"It may be remarked in conclusion that the Galbulidæ and Bucconidæ are well differentiated off from the Capitonidæ and their allies, which also are anomalognathous and 'scansorial,' by the latter having a tufted oil-gland and *no* cæca, at the same time that the external pectoral branch comes off from the main tract near the beginning of the breast. Other important points of difference between the two are the imperfect clavicles§, different pterylosis, single carotid, lengthy deltoid, *scapula accessoria*, and intestinform gall-bladder of the Piciform birds, all very different from what occur in the Passeriform Galbulidæ."

* Ibis, 1880, p. 401.

† P. Z. S. 1874, p. 119; Coll. Papers, p. 217.

‡ Most of the Meropidæ likewise have only the left carotid; *Nyctiornis*, however, has two.

§ *Indicator* agreeing in this point with the rest of Garrod's "Capitonidæ."

II. Structure of the Jacamars.

Having said thus much as to the place in the Systema Avium of these two families, I will proceed to the following remarks upon various portions of their structure, which, as already mentioned in the Preface, Mr. W. A. Forbes has most kindly drawn up for me.

a. External Characters and Pterylosis*.

The nostrils are situated nearer the upper than the lower margin of the mandible. Their apertures are oval, or slightly sigmoidal in shape. They have a well-developed operculum, but are left uncovered by the frontal plumes. Behind each are a few large and conspicuous, forwardly-directed bristles, the most anterior of the rictal series. The eyelids, both upper and lower, have distinct eyelashes. The feet (*cf.* figs. 1-6, *e*) are feeble, with the hallux (which is absent in the genus *Jacamaralecyon*) and fourth digit reversed. The tarsi are covered anteriorly with transverse scutellæ, which are obsolete in *Urogalba* and *Galbula albirostris*, whilst behind they are covered with smooth naked skin, along the external aspect of which a few feathers may be prolonged downwards as far as the digits. The second digit is united with the third to about the middle of the second phalanx.

The oil-gland is always nude, and has a bluntly triangular tip. There are twelve rectrices in the species examined†, the outer pair being much shorter than their fellows, as shown in the figures (*infra*, pp. xx-xxv, *d*). The wings have 10 primaries, the tenth (or so-called "first") being always abbreviated, and 12 secondaries, the total number of remiges being thus 22. The feathers have a small aftershaft.

Nitzsch‡ has described and figured the pterylosis of *Galbula viridis*, and also examined *Jacamerops*. The following description of the pterylosis is based on my examination of *Galbula rufoviridis*, with which the other species already named agree essentially.

The tracts are all narrow, generally only two feathers wide. The dorsal tract forms a very slight fork indeed between the scapulæ, and is here somewhat interrupted, its cervical part being stronger than the more posterior, which has the form of a long fork, enclosing a good median space, and only connected with the former by a few weaker feathers uniserially arranged. The united part of this tract is short. External to this posterior fork are a few smaller feathers on each side, which run in a line backwards towards the acetabulum. The lumbar and humeral tracts are both distinct, but not broad; the former are quite free from the dorsal tract. The inferior tract starts from the *symphysis mandibulæ*, and runs along in the intermandibular space to divide opposite the angle of the jaw, the two halves of the tract remaining thence separate till they terminate just before the vent. Just before getting onto the breast, the tract emits on each side a short, inwardly-directed, "gular" branch, which runs for a short way on the anterior surface of the great pectoral muscle, nearly along the line of the clavicle. When about halfway down the sternum the main tract gives rise to a short, but little divergent, outer pectoral branch, from the end of which a few feathers run uniserially outwards and forwards towards the axilla.

* The observations subjoined have been made on spirit-specimens of *Galbula rufoviridis* (two), *G. albirostris*, and *Urogalba paradisea*, and on a skin of *Jacamerops grandis*.—W. A. F.

† Only ten in *Brachygalba* and *Jacamaralecyon*, the small outer pair being deficient. See below, pp. xxii, xxiii.—P. L. S.

‡ 'Pterylography' (Ray Soc.'s ed.), p. 90, pl. iv. figs. 7, 8.

Here this branch nearly, but not quite, unites with a similar row of somewhat weaker feathers, which runs obliquely outwards and backwards from the main tract, arising at about the same level as the inwardly-directed gular tract in common with the narrow tract that connects the cervical with the patagial and humeral tracts. Between the main tract and its two outer branches are a few small semiplumes on the breast. There is no specialized *hypopterum*; but the lower surface of the wings has a scanty covering of semiplumes, a few of which are also found on the *apteria*.

Nitzsch, in his 'Pterylographie,' places the Galbulidæ along with *Coracias*, *Merops*, *Momotus*, and *Todus* in his third group ("Todidæ" or "Cuculinæ calopterae") of the Picariæ, the gular branch of the pectoral tract separating the *Galbulæ* from the other members of the group. But he does not appear to have observed the tendency to a break between the scapulæ in the dorsal tract, the retrocurrent line of feathers between its posterior part and the lumbar tracts, or the connexion between the outer pectoral branch and the main inferior tract by means of the forward- and backward-running feathers above described. All these features approximate the Galbulidæ to the Bucconidæ, which latter were included by Nitzsch together with the true Capitonidæ under the Picinæ.

The Bucconidæ, however, differ from the Galbulidæ in having no aftershaft to the feathers, and in wanting the gular branch to the pectoral tract.

b. *Visceral Anatomy and Myology*.*

The interior of the mouth is smooth, except round the opening of the nares, where there are a number of very small, slightly elevated spines. The larynx, behind the glottis, is also spiny superiorly. The tongue is very long (an inch in length in *G. rufoviridis*), thin, and flat; it tapers anteriorly, and is membranous for the greater part of its extent. The base is emarginate, and beset with a few spines, one or two of which just extend onto the lateral margin of the organ.

There is no crop. The proventriculus is zonary; the gizzard fairly muscular, globose in shape, and lined internally with hard plicated "epithelium." The liver has its right lobe larger; and I have not been able to discover any gall-bladder†.

The intestines are not voluminous, and very short, measuring in length 5 inches in *Galbula*, 6 inches in *Urogalba*; of this, about 0.75 inch is large intestine. The cæca are large (about as long as the large intestine) and capacious, of the same shape as in the Cuckoos, Coraciidæ, Caprimulgidæ, and allied groups, being dilated and globose at the apex, and somewhat narrowed basally. The spleen is oval.

There are always two carotid arteries; and, as in nearly all birds, the main artery of the thigh accompanies the sciatic nerve. The syrinx has a single pair of intrinsic muscles. The *sterno-tracheales* run to the end of the costal processes.

Myologically, the *pectoralis secundus* extends about two thirds down the sternum; but the *pectoralis tertius* is absent. The *pectoralis primus* sends slips to the tendons of both the *tensor patagii longus* and *brevis*. The terminal tendon of the latter, where it meets the *extensor metacarpi radialis longior* muscle, sends back a recurrent slip of tendon to the lower end

* The species examined are—*Galbula rufoviridis* (two specimens), *G. albirostris*, and *Urogalba paradisea*.

† As Burmeister also found no gall-bladder in the Bucconidæ, this organ is probably absent.

of the humerus, from which is given off, about halfway along its course, a thin band of tendon which runs to the ulnar side of the arm, and is there lost in the general fascia. In *Urogalba* the main tendon, before it reaches the *extensor* muscle, sends off a special "wristward" slip, which joins that muscle nearer the hand.

The *biceps* slip to the patagium is absent; but there is a well-developed "*expansor secundariorum*," which terminates interthoracically in a T-shaped tendon ("ciconiiform," Garrod). Of this the much larger posterior moiety runs to be attached to the costal process of the sternum, whilst the other is attached to the scapula close to its glenoid extremity. The deltoid extends about halfway down the humerus, and has a special tendinous slip from the scapula. The *triceps* has no humeral slip, arising entirely from the scapula.

In the leg the *gluteus primus* and *quintus* muscles are quite absent, as are also the *ambiens* and accessory femoro-caudal. The accessory *semitendinosus* is small, and in *Urogalba* quite absent. The "formula" for the Galbulidæ is therefore:—A. XY, or A. X*. The *obturator internus* is small and oval. The deep flexor tendons of the leg are arranged as in the *Pici*, the *flexor longus hallucis* supplying both the second and fourth toes as well as the first, the *flexor perforans digitorum* the third alone. There is a small *vinculum* developed between the two main tendons.

c. Osteology.

Very little appears to have been published on the osteology of the Galbulidæ. Blanchard† has described and figured the sternum of *Galbula rufo-viridis*, and has insisted on its likeness to that of *Todus*, *Bucco*, and *Megalæma*‡, whilst Prof. Huxley, in his paper on the classification of birds, has devoted a line and a half to the consideration of the skull of *Galbula*, which he states "closely resembles" that of *Bucco*.

Thanks to the kindness of Mr. Salvin, I have by me skeletons of three species of this group—namely, *Galbula chalcothorax*, *G. viridis*, and *Brachygalba lugubris*; and I have also examined skulls of *Jacamerops grandis* (an imperfect one extracted from a skin) and *Galbula rufo-viridis*.

I have taken *Galbula chalcothorax* as the type for the following notes:—

In the skull the interorbital and internasal septa are largely ossified, as are the nasal cartilages, with which last, as also with the internasal septum, the somewhat spongy maxillo-palatine processes unite, as they also do too with each other, across the middle line, so that the palate is completely "desmognathous." The palatines, which are flattened plates, obliquely truncated posteriorly, develop along the inner margin posteriorly a downwardly directed keel, which anteriorly meets its fellow of the opposite side in the middle line, just behind, though quite free from, the more anteriorly situated bridge formed by the maxillo-palatines. The vomer is apparently absent. The pterygoids are nearly straight, somewhat compressed rods of bone. There are no basipterygoid facets. The foramen magnum is very large, and, with the general occipital region, looks backwards and downwards. The ectethmoid is large and spongy. The lachrymal is not ankylosed to the rest of the skull; it is separated by a narrow chink from the

* Cf. Garrod, P. Z. S. 1874, p. 123, and Coll. Papers, p. 222.

† Ann. Sci. Nat. (4), Zool., xi. pp. 122–124, pl. v. figs. 16–18 [1859].

‡ Eytton, in his 'Osteologia Avium' (p. 55), has very briefly described some points of the skeleton of a *Galbula* (of an unknown species), and has given measurements of the various bones.

ectethmoid, and sends downwards a curved process, which meets, and is connected with, the maxilla. The postorbital process of the skull is long, and nearly reaches the malar arch.

The symphysis mandibulæ is nearly half the length of the lower jaw. The angle of the jaw is truncated, with a strong, triangular, somewhat recurved process internally. Two small ossicles, apparently similar to those described by Nitzsch* as *metagnathia* in the Passeres, exist in the fibrous tissue external to the quadrato-mandibular articulation.

There are fourteen cervical and five dorsal vertebræ, the last dorsal being ankylosed to the sacrum, but carrying a pair of ribs. The fifth, sixth, and seventh cervicals have bony bridges developed between the anterior zygapophyses and the transverse processes. The last two cervicals have well-developed free ribs. There are five pairs of true ribs, of which four articulate with the sternum directly. These four, as well as the last cervical, support uncinatæ processes. Hypapophyses are developed on the first two dorsal vertebræ. There are eleven sacral and five free caudal vertebræ, these last having, as well as the compressed triangular pygostyle, well-developed transverse processes. The total number of vertebræ is thirty-five, of which nineteen are præsacral.

The body of the sternum is triangular, tapering to quite a point behind. Posteriorly it has four very deep notches, extending half the total length of the sternum. Of these the inner pair are wider and bigger than the outer, but not quite so deep. The internal xiphoid process is almost straight and rod-like; the external one, on the other hand, is expanded at its termination into a large, somewhat falcate tip. The costal process is small, and pointed forward and outwards. The manubrium is well marked, but not bifurcated. It is keeled anteriorly; and the anterior margin of the sternum, which in profile is nearly straight, runs onto it.

The ilia, anterior to the acetabulum, are short and oblique; they are widely separated in the middle line by the co-ossified neural spines of the "sacral" vertebræ. The postacetabular ridge is well marked, ending in the strong posterior iliac spine, which is united by a thin bony bridge with the ischium, nearly at right angles to the axis of the latter. The pubes are slender and recurved; and, as in most birds which lack the *ambiens* muscle, there is no prepubic process.

The clavicles are well developed; they are convex forwards, and form a U-shaped "merry-thought." There is no backwardly directed hypocleidium at their symphysis; but the scapular ends are expanded, and moderately compressed, articulating with both scapula and coracoid.

The first metacarpal has a conspicuous process developed radially, which is covered only by naked skin, and may easily be seen or felt in the fresh bird. The first phalanx of the index has a strong postaxially directed process at its distal end, which articulates with the extremity of the corresponding phalanx of the third digit. The tibia has the cnemial process but very slightly developed. Below, its anterior face has a bony bridge, through which the *extensor communis digitorum* passes. The anterior aspect of the tarso-metatarsæ, which bone is very short, not exceeding in length the third basal phalanx of the third digit, is extensively grooved externally. There is a small "calcaneal" process posteriorly at its upper end, grooved by a deep canal for the flexor muscles of the foot. The external articular facet is much shorter than the others; it is divided into two articular surfaces, and, in accordance with the reversed fourth toe, looks backwards.

* Zeitschr. f. d. gesammt. Naturw. xix. p. 398 [1862].

In *Galbula viridis* there are only ten sacral vertebræ, and the first dorsal vertebra only has an inferior process, the second wanting it. The number of uncinæ processes is only four, the most posterior dorsal one of *G. chalcothorax* being absent in this species.

In *Brachygalba* the palatine keels do not quite meet each other anteriorly, and the manubrium sterni is distinctly bifid, as it is in most Passeres, *Merops*, and some other groups. The dorsal vertebræ have *no* hypapophyses at all. The last two are ankylosed with the sacrum. There are five pairs of uncinæ processes. The last three cervical vertebræ have well-developed hypapophyses, of which those on the twelfth and thirteenth are unsymmetrical, whilst that on the last (fourteenth) is stronger and nearly simple.

III. History of the Jacamars.

The Jacamars were mostly united by the older authors with the Kingfishers; but so long ago as 1760 the accurate French naturalist Brisson made a genus (*Galbula*) for their reception*. Brisson recognized two species of the genus (*Galbula viridis* and *Urogalba paradisea*, as here denominated). Latham, in his 'Index Ornithologicus' (1790), was the first systematist to adopt the genus *Galbula* in its classical form, and assigned four species to it—*Galbulæ viridis*, *grandis*, *paradisea*, and *albirostris*—which names, however, were simply latinized from terms previously bestowed upon them in his 'Synopsis.'

In 1802 Audebert and Vieillot figured such of the Jacamars as were then known in the first volume of their 'Oiseaux Dorées.' Vieillot, who seems to have been the sole author of this part of the work, includes among the Jacamars the same four species as are given by Latham. Four years subsequently (1806), Levaillant published, in the second volume of his 'Oiseaux de Paradis,' his 'Histoire Naturelle des Jacamars.' Levaillant's essay on this group is certainly much in advance of those of his predecessors. He gives the first distinct account of *Galbula ruficauda*, and distinguishes the "Jacamars à bec courbe" for the first time under the title *Jacamérops*, which has since been generally retained for this section in its Latin form. At the same time Levaillant fell into errors, in giving a place in his new genus to what is undoubtedly a fictitious species (his "*Grand Jacamar*") and in supposing that his "*Jacamarici*" (*Jacamérops grandis*) was from the Moluccas. In a supplementary article on the Jacamars attached to his 'Histoire Naturelle des Promérops et Guépriers,' Levaillant added two more species to the genus under French terms, thus recognizing all together seven species of the group as now known to us.

After Levaillant there is little to record in the history of these birds until 1817, when Vieillot's article "Jacamars," in the seventeenth volume of the 'Nouveau Dictionnaire d'Histoire Naturelle' was published. Vieillot here added two to the classical roll of the genus *Galbula*, namely *G. leucogastra* and *G. tridactyla*. But both of these birds had been already figured by Levaillant, as above mentioned, although Vieillot was the first to give them Latin names. In 1823 Vieillot again published an account of the Jacamars, in the "Ornithologie" of the 'Tableau Encyclopédique et Méthodique,' but recognized no more than the seven species of Levaillant (*Urogalba paradisea*, *Galbula viridis*, *G. ruficauda*, *G. albirostris*, *G. leucogastra*, *Jacamaralcyon tridactyla*, and *Jacamérops grandis*). These seven species of Jacamars were in fact all that were

* For the derivation of this term see p. 8, *infra*.

known to science up to this date; but a year later (1824) Spix's great work on the birds of Brazil was published, and brought two more species of Galbulidæ to our knowledge (*Galbula tombacea* and *Brachygalba albigularis*).

In 1832 Prince Maximilian, of Neuwied, in his 'Beiträge zur Naturgeschichte der Brasilien,' gave an excellent account of the Brazilian representative of typical *Galbula* (*G. rufo-viridis*), but, unfortunately, did not distinguish it as a species from the Guianan form. This was first done in 1838 by Swainson in the third part of his 'Animals in Menageries,' where he published descriptions of seven different species of Jacamars in his own collection. But Swainson, unluckily, proposed to apply to the Brazilian bird a term previously given to another species. In the same volume Swainson gave the first description of *Brachygalba lugubris*, from examples obtained in Demerara by Schomburgk, but made the curious error of describing it as "three-toed."

In 1840 Dr. Burmeister published at Halle the very important researches of the deceased naturalist Nitzsch upon the "pterylography" of birds. As regards the arrangement of the feathers, Nitzsch had convinced himself that the Galbulidæ were more like the Meropidæ than any other form, and accordingly arranged them along with the latter in the section Cuculinæ calopterae or Todidæ of the order Picariæ (Pterylogr. p. 128).

We may now pass on to 1847, when the number of the great standard work of Gray and Mitchell, on the Genera of Birds, containing the Jacamars was issued. Here Gray classed the Jacamars as the fourth subfamily of the family "Alcedinidæ," and divided them into two genera, *Galbula* and *Jacameros*, assigning ten species to the former and two to the latter genus. Discarding *Jacameros boersi* (founded on Levaillant's fictitious species) and inserting *Galbalcyrrhynchus leucotis*, described in 1845, but apparently overlooked by Gray until he published his Appendix (p. 5), we find, in fact, that twelve species of Jacamars were known up to their date, although Gray did not give the names and synonyms quite correctly in every case. In the following year Gray published the portion of the 'List of Specimens of Birds in the British Museum' containing the "Fissirostres." Here, again, nearly the same arrangement of the so-called subfamily Galbulinæ was employed, except that "*Jacamaralecyon*" was adopted as an independent genus.

The next succeeding writers on this group took a much more just view of its rank in the natural series. Both Cabanis and Bonaparte fully allowed the claims of the Jacamars to a status as an independent family of birds. In 1850 Bonaparte issued the first part of his celebrated 'Conspectus.' Here the Galbulidæ are ranked as an independent family of "Volucres," and are placed between the Trogonidæ and Alcedinidæ. Twelve species, divided into four genera, are assigned to the family. In the following year Dr. Cabanis gave an excellent summary of the then existing condition of our knowledge of the Galbulidæ in an article published in Ersch and Gruber's 'Encyclopädie der Wissenschaften und Kunst.' Dr. Cabanis recognized sixteen species of the family, and here gave the first description of *G. cyanopogon*, besides being the first who properly discriminated *G. rufo-viridis* from its allied forms. Being a purist as regards nomenclature, Dr. Cabanis proposed to substitute *Cauax* as a generic term for "*Jacamaralecyon*," and "*Cauacias*" for *Galbalcyrrhynchus*, in which, I must say, I am sorely tempted to follow him!

Following closely upon Dr. Cabanis three authors published their views on the Galbulidæ in 1852. The well-known American ornithologist Cassin catalogued the specimens of the family

in his 'Catalogue of the Halcyonidæ in the Collection of the Academy of Natural Sciences of Philadelphia.' Fifteen species were here recognized as belonging to the Galbulidæ, which are arranged as a fourth subfamily of the "Halcyonidæ," and somewhat unnaturally inserted between the "Dacelininæ" and the "Tanysipterinæ," two groups of typical Kingfishers. In the same year Reichenbach, at Dresden, issued the section of his 'Handbuch' containing the "Meropinæ," of which, according to that author, the "Galbulinæ" form a portion. There is little original in Reichenbach's treatise, except that *Galbula chalcoptera* is described as a new species (though it is doubtless the same as Swainson's *G. lugubris*), and the generic term *Jacamaralcyonides* is shortened by the omission of the first three syllables. Seventeen species of the family are recognized, and assigned to four genera.

Early in 1852, also, I commenced my studies on the Jacamars, when resident at Oxford, and published my first essay on the subject in Sir William Jardine's 'Contributions to Ornithology' for that year, under the title of a "Synopsis of the genus *Galbula*." This I shortly followed up by describing a new species in the same periodical as *G. melanogenia*. These two papers were subsequently joined together and reprinted, with an additional account of the other known species of the family, under the title 'Synopsis of the Galbulidæ.' In this general synopsis of the family I recognized seventeen species as more or less perfectly known, and divided them among five genera.

In 1854 Bonaparte comprehended a list of the Jacamars in his 'Conspectus Volucrum Zygodactylorum,' a somewhat hastily drawn up compilation of names, published in an obscure Italian periodical called 'L'Ateneo Italiano,' but important as introducing a number of new generic terms into science. In this essay the "Galbulidæ" are arranged at the end of the "Stirps Barbati," after the Puff-birds and anomalous form *Leptosoma*. Six genera are acknowledged, containing all together seventeen species.

In the following year (1855) I read a paper on the Jacamars before the Zoological Society of London, which was subsequently published in their 'Proceedings'*. In it I described three new species, *Galbula fuscicapilla*, *Urogalba amazonum*, and *Brachygalba melanosterna*, the first of which I now believe to be barely distinguishable from *G. tombacea*. In the "Tabula Galbulidarum Geographica" appended to this essay, I recognized the existence of twenty species of the family, divided into six genera, the latter being just the same as those adopted in the present work.

Again, in the next following year (1856) two important works bearing on the Jacamars were published. Dr. Burmeister treated of this group in the second volume of his 'Systematische Uebersicht der Thiere Brasiliens,' where the Jacamars are arranged after the Trogons, Barbets, and Puff-birds, as the fourth subdivision of his family "Bartvögel" (Bucconinæ), and some good general remarks are given on their structure, although there is nothing novel in the treatment of the species. Herr v. Pelzeln in the same year published, in the 'Sitzungsberichte' of the Vienna Academy, the valuable MS. notes made by the great field-naturalist Natterer on these birds during his prolonged travels in tropical Brazil, which are still our best authority for the coloration of the naked parts in this and other groups.

* "Remarks on the Arrangement of the Jacamars (Galbulidæ), with Descriptions of some new Species."—P. Z. S. 1855, p. 13.

The six years after the issue of the two last-mentioned publications passed away without material influence on the history of the Galbulidæ. But in 1862 and 1863 the group came again under review. In 1862 I catalogued the examples of the Galbulidæ in my collection, in my 'Catalogue of American Birds.' My collection then embraced thirty-three specimens, referred to fourteen species, of which the synonyms are fully given in the 'Catalogue.' In 1864 Messrs. Cabanis and Heine fil. published the first division of the fourth part of their celebrated catalogue of the Museum Heineanum. The Galbulidæ are here arranged next to the Trogonidæ, and a complete account of all the species known to the authors is given. These are twenty in number, and are referred to six genera (omitting the fictitious *Galbuloides*). Several of the generic terms are changed, as not being classically compounded.

In his remarkable essay on the palatal structure of birds, published in 1867*, Professor Huxley first recorded the fact that, as regards this part of its conformation, *Galbula* closely resembles *Bucco*, and arranged both these forms in the second section of his Coccozomorphæ.

In 1869 Gray issued the first volume of his 'Hand-list of Birds,' which included the Jacamars. They are here arranged as a separate family of "Fissirostres Diurnæ," following the Meropidæ; and the list contains twenty-two species, divided into three genera.

In 1871 Herr v. Pelzeln gave a more complete account of the *Galbulæ* collected by Natterer, in his 'Ornithologie Brasiliens.' That excellent and energetic naturalist seems to have sent home no less than 104 specimens of these birds, illustrative of eleven species.

In our catalogue of the Neotropical avifauna, published in 1873†, Mr. Salvin and I recognized nineteen species of the family Galbulidæ, and located it, according to the modification of Professor Huxley's system which we followed, at the head of the series of "Coccyges Zygodactylæ."

In conclusion I may mention that at present my cabinets contain sixty-five skins of Jacamars, amongst which all the known species are represented, and those of Messrs. Salvin and Godman ninety-nine specimens of sixteen species. The present work is based entirely upon the series formed by these two collections.

IV. Classification of the Jacamars.

As will be found mentioned in the article on *Jacameroops grandis*, I consider that the Galbulidæ may be most naturally divided into two groups, of one of which *Jacameroops* is the sole known representative, while the five remaining genera belong to the typical Galbulinæ. The six genera of Galbulidæ may be shortly diagnosed as follows:—

Family GALBULIDÆ.

Subfam. GALBULINÆ: rostrum rectum, elongatum, compressum, acutum; apertura narium rotunda, nuda, setis paucis obsita; rectrix externa aut parva aut absens.

A. Caudâ elongatâ, plus minusve graduatâ.

a. Rectricibus mediis valdè elongatis 1. *Urogalba*.

b. Rectricibus mediis vix ultra reliquas protensis 2. *Galbula*.

* P. Z. S. 1867, p. 415.

† 'Nomenclator Avium Neotropicalium:' London, 1873.

B. Caudâ brevi quadratâ.

c. Rectrice utrinque externâ deficiente,

digito primo præsentē 3. *Brachygalba*.digito primo nullo 4. *Jacameralcyon*.d. Rectrice externâ præsentē 5. *Galbalcyrrhynchus*.

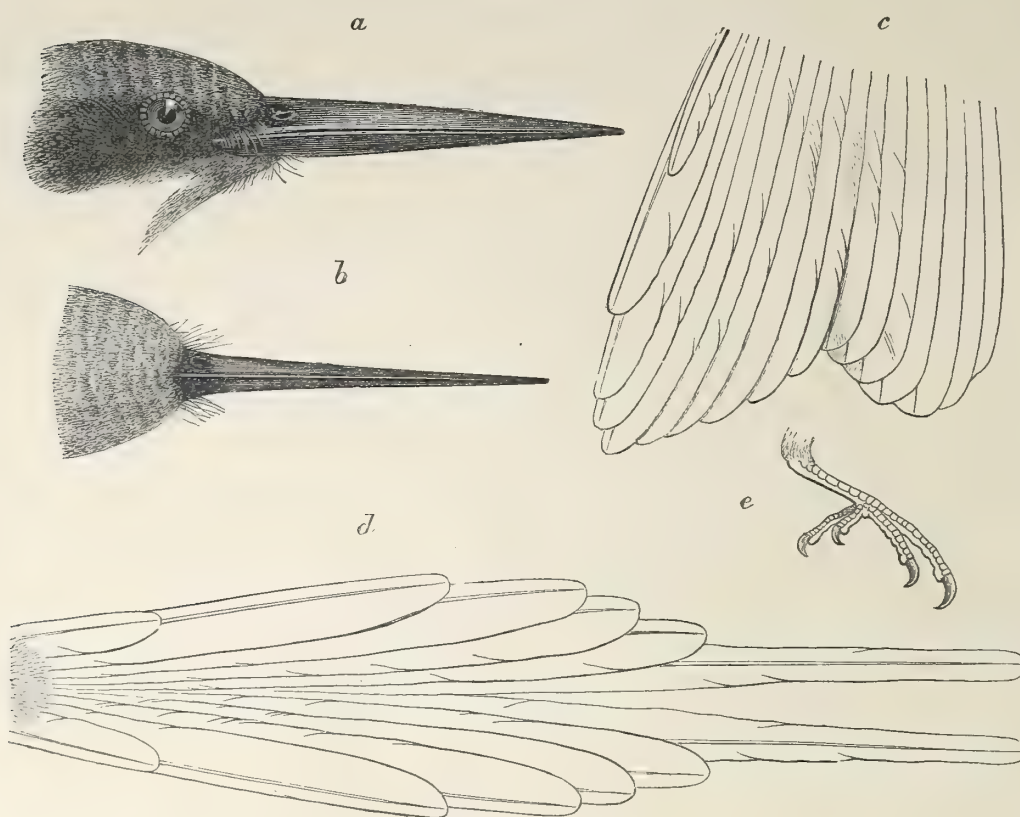
Subfam. JACAMEROPINÆ: rostrum incurvum, ad basin dilatatum; apertura narium membranâ internâ cincta; rectrix externa modica, mediæ dimidium vix æquans . . 6. *Jacamerops*.

Genus I. UROGALBA.

Type.

Urogalba, Bp. Consp. Vol. Zyg. p. 13 (1854) *U. paradisea*.*Uroceæ*, Cab. et Hein. Mus. Hein. iv. p. 216 (1863) *U. paradisea*.

Fig. 1.

*Urogalba paradisea*.

a. Bill, from side. b. Bill, from above. c. Wing-end, from within. d. Tail-end, from below.

e. Left foot, from inside.

CHAR. GEN. Rostrum rectum, elongatum, compressum, acutum, aperturâ narium rotundâ nudâ; alæ rotundatæ, remigibus tertio, quarto, quinto, et sexto longissimis, primum plus quam duplo excedentibus; cauda e rectricibus xii. composita, rectrice utrinque extimâ brevissimâ a tectricibus ferè celatâ, duabus mediis longissimis ultra reliquas valdè protensis et attenuatis; tarsi breves; pedes debiles, digito primo modico.

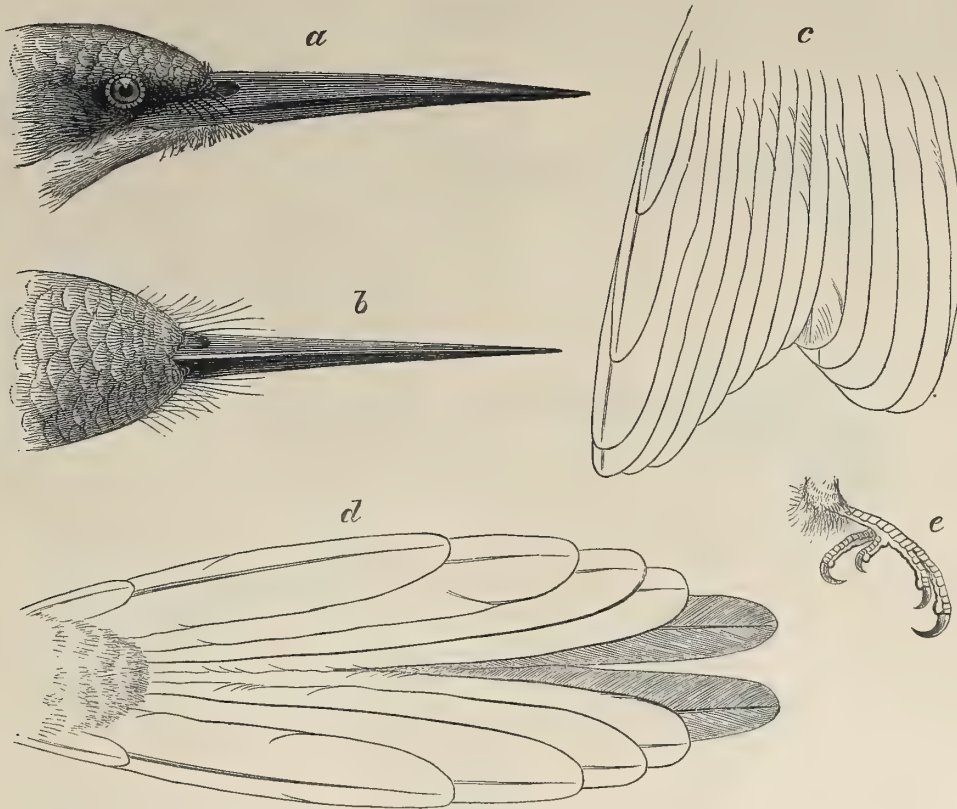
The genus *Urogalba* contains two nearly allied species, which may be separated as follows:—

- Crassitie minore; pileo fusco unicolori 1. *U. paradisea*, p. 1.
 Crassitie majore; pileo albicanti-fusco 2. *U. amazonum*, p. 5.

Genus II. GALBULA.

	Type.
<i>Galbula</i> , Briss. Orn. iv. p. 85 (1760)	<i>G. viridis</i> .
<i>Caucalias</i> , Cab. et Heine, Mus. Hein. iv. p. 218 (1863)	<i>G. leucogastra</i> .

Fig. 2.



Galbula ruficauda.

- a. Bill, from side. b. Bill, from above. c. Wing-end, from within. d. Tail-end, from below.
 e. Left foot, from inside.

CHAR. GEN. *Urogalbæ*, sed caudæ rectricibus graduatis, duabus mediis reliquis vix aut paulò superantibus.

Nine species belong to the typical genus *Galbula*, as here considered, which may be diagnosed as follows:—

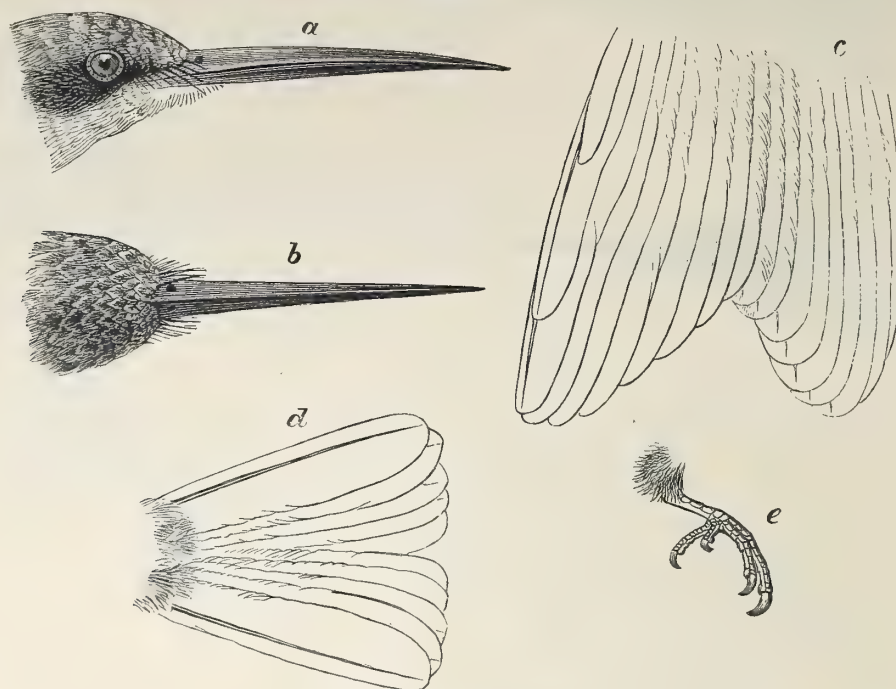
- A. Rectricibus lateralibus cærulescenti-nigris 1. *G. viridis*, p. 7.
 B. Rectricibus lateralibus plus minusve rufis.
 a. Fasciâ pectoris æneo-viridi, gulâ discolori,
 rectr. lat. nigro terminatis 2. *G. rufo-viridis*, p. 11.
 rectr. v. lat. omninò rufis 3. *G. ruficauda*, p. 15.
 rectr. iv. lat. omninò rufis 4. *G. melanogenia*, p. 19.
 b. Pectore gulâque æneo-viridibus concoloribus 5. *G. tombacea*, p. 23.

- c. Pectore rufo ventri concolori,
 genis viridibus; maculâ gulari maris albâ 6. *G. albirostris*, p. 27.
 genis cæruleis; maculâ gulari maris nullâ 7. *G. cyaneicollis*, p. 31.
- C. Rectricibus lateralibus cineraceis.
 minor; dorso et pectore æneo-viridibus 8. *G. leucogastra*, p. 33.
 major; dorso et pectore cupreo-purpureis 9. *G. chalcothorax*, p. 37.

Genus III. BRACHYGALBA.

- | | |
|--|----------------------------------|
| <i>Brachygalba</i> , Bp. Consp. Vol. Zyg. p. 13 (1854) | Type.
<i>B. albigularis</i> . |
| <i>Brachyces</i> , Cab. et Heine, Mus. Hein. iv. p. 214 (1863) | <i>B. lugubris</i> . |

Fig. 3.

*Brachygalba lugubris*.

- a. Bill, from side. b. Bill, from above. c. Wing-end, from within. d. Tail-end, from below.
 e. Left foot, from inside.

CHAR. GEN. *Galbulæ*, sed caudâ breviorē, quadratâ, rectrice externâ omninò deficiente; pedes debiliores, digito primo minuto.

Up to the present time five Jacamars only are known belonging to this group. They may be recognized as follows:—

- A. Rostro nigro
 gulâ fuscâ 1. *B. lugubris*, p. 39.
 gulâ albâ,
 pileo et fasciâ pect. fuscis 2. *B. goeringi*, p. 41.
 pileo et fasciâ pect. viridibus 3. *B. salmoni*, p. 43.

B. Rostro albo,

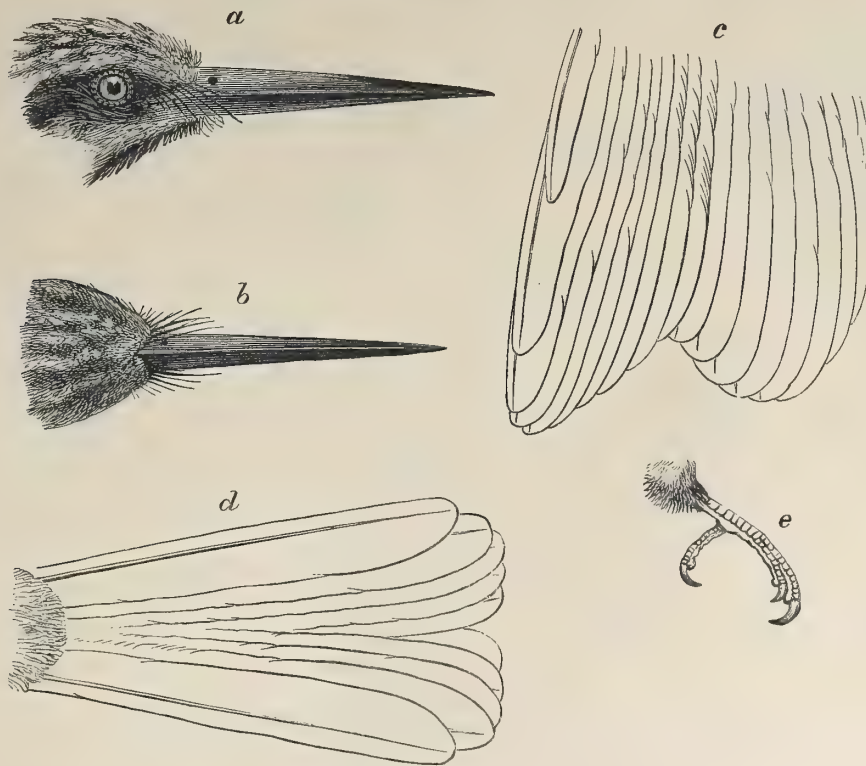
genis albis, gulâ concoloribus 4. *B. albigularis*, p. 45.genis fuscis, pileo concoloribus 5. *B. melanosterna*, p. 47.

It may be noted that in a large series of *B. lugubris* recently obtained in British Guiana by Mr. Whitely, the sexes (as determined by the collector) are alike, both male and female having a conspicuous white ventral patch. It is probable, therefore, that the specimen figured (Pl. XI.) and described (p. 40) as a female, with this patch rufescent, is immature, or even that the Colombian form with the rufous belly may belong to a distinct species.

Genus IV. JACAMARALCYON*.

	Type.
<i>Jacamaralcyon</i> , Less. Tr. d'Orn. p. 235 (1831)	<i>J. tridactyla</i> .
<i>Cauax</i> , Cab. in Wieg. Arch. 1847, i. p. 347	<i>J. tridactyla</i> .

Fig. 4.

*Jacamaralcyon tridactyla*.

a. Bill, from side. b. Bill, from above. c. Wing-end, from inside. d. Tail-end, from below.
e. Left foot, from inside.

CHAR. GEN. *Brachygalbæ*, sed caudâ elongatiore, et digito primo omninò absente.

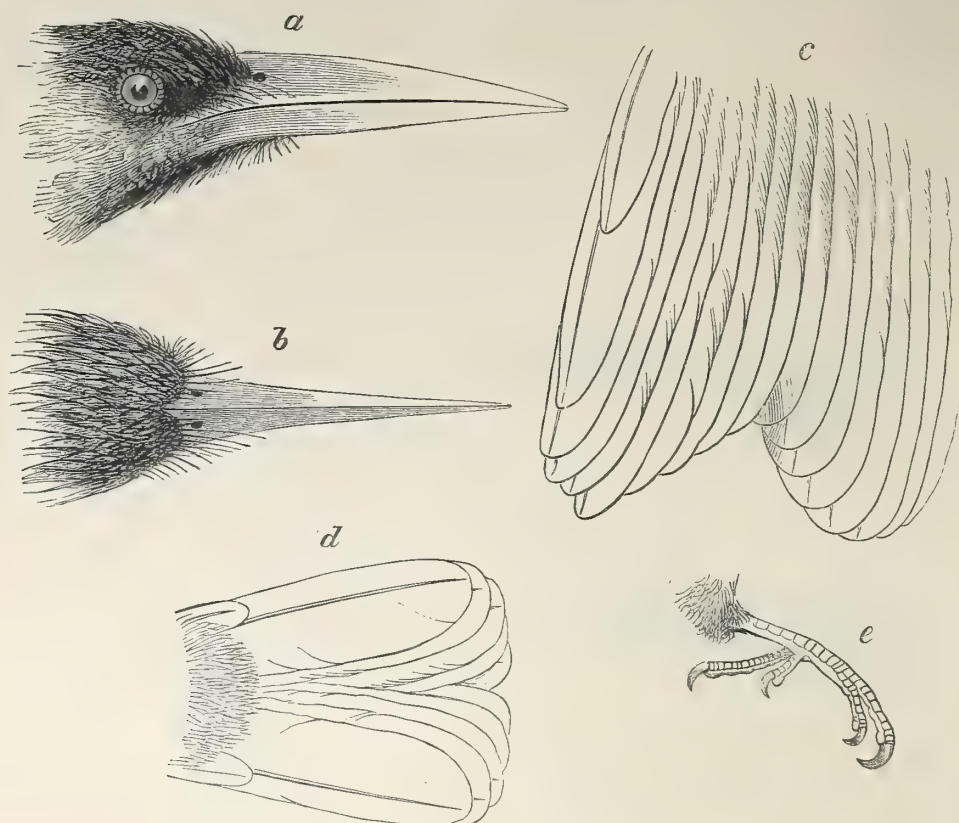
The only known species of this genus is *J. tridactyla*, p. 49.

* "*Aleyon*, Spix, 1824," is given by Gray and other writers as a synonym of this genus. But this term is not to be found in Spix's '*Aves Brasilienses*,' and appears to rest on a misquotation of Cuvier (*Règn. An.* 1829, i. p. 448).

Genus V. GALBALCYRHYNCHUS.

	Type.
<i>Galbalcyrrhynchus</i> , Des Murs, Rev. Zool. 1845, p. 207	<i>G. leucotis</i> .
<i>Jacamaralcyonides</i> , Des Murs, Icon. Orn. t. 17 (1849)	<i>G. leucotis</i> .
<i>Cauecias</i> , Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 310 (1851)	<i>G. leucotis</i> .
<i>Alcyonides</i> , Reich. Handb. d. sp. Orn. p. 83 (1851)	<i>G. leucotis</i> .

Fig. 5.

*Galbalcyrrhynchus leucotis*.

- a. Bill, from side. b. Bill, from above. c. Wing-end, from within. d. Tail-end, from below.
e. Left foot, from within.

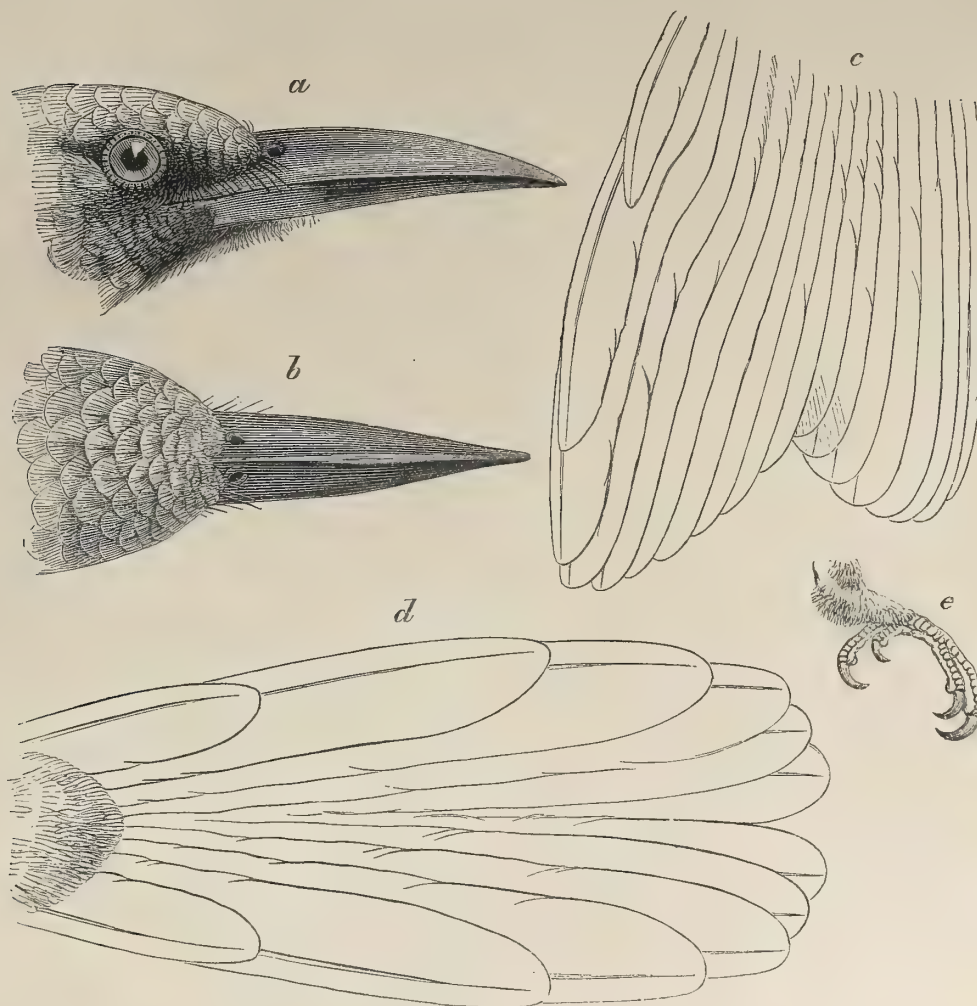
CHAR. GEN. Rostrum *Galbulæ*, sed brevius, altius et adhuc magis compressum; cauda brevis, quadrata, e rectricibus xii., unâ utrinque externâ brevissimâ a tectricibus vix dignoscendâ; pedes validiores, digito primo modico.

Here also we have only one species of this singular form *G. leucotis*, p. 53.

Genus VI. JACAMEROPS.

	Type.
<i>Jacamerops</i> *, Less. Trait. d'Orn. p. 234 (1831)	<i>J. grandis</i> .
<i>Lamprotila</i> , Sw. Class. B. ii. p. 336 (1837)	<i>J. grandis</i> .

Fig. 6.

*Jacamerops grandis*.

a. Bill, from above. b. Bill, from side. c. Wing-end, from within. d. Tail-end, from below.
e. Left foot, from within.

CHAR. GEN. Rostrum capite paulo longius, arcuatum, incurvum, ad basin dilatatum, culmine exsurgente; alæ rotundatæ, remigibus quarto et quinto longissimis et primum ferè duplo superantibus; cauda rotundata, e rectricibus xii. composita; tarsi breves; pedes debiles, digito primo modico.

The genus *Jacamerops*, again, is monotypic, the only known species being *J. grandis*, p. 57.

* This term is attributed by Gray (Hand-list, i. p. 182) and others to Cuvier (1829). But Cuvier does not appear to have used it as a *Latin* term. Cf. Règn. An. (1829) i. p. 448.

SCL. Jac. & Puffb.—*July*, 1882.

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V. Habits and Distribution of the Jacamars.

Nearly all the particulars that I have been able to find recorded concerning the habits of the Jacamars are given under the heads of the various species to which they refer. On the whole they are exclusively arboreal and forest-loving birds, the true Jacamars keeping more to the outskirts of the forests and to the summits and outer branches of the trees, while *Jacamerops* rather resembles the Trogons, and is found only in the dense interior. All of them seem to be purely insectivorous.

Little is as yet known about the nesting-habits of this family; and I have never seen a Jacamar's egg. But Mr. Kirk has recorded that in Tobago *G. ruficauda* "builds in marl-banks like the Motmot," and lays "pure white eggs, nearly circular" in shape; and Herr Euler states that *Jacamaralcyon tridactyla* "bores holes in the steep banks, no doubt for purposes of nidification." Of *Jacamerops* Schomburgk tells us the same story; but Mr. Bartlett was informed by the Indians of Upper Amazonia that *Jacamerops* also nests in stumps of old trees. It is probable that the other members of the group do not deviate from these practices.

As regards their distribution, the Jacamars are entirely restricted to the wooded districts of the Neotropical Region. Here they are met with in four of the six subregions into which I divide this region, being absent only in the Antillean and Patagonian Subregions, and being most prevalent in the Amazonian Subregion, as will be seen by the subjoined table:—

	TRANSPANAMANIC SUBREGION (2).		COLOMBIAN SUBREGION (7).			AMAZONIAN SUBREGION (14).				BRAZILIAN SUB- REGION (3).	
	I. Mexico and Guatemala.	II. Costa Rica and Panama.	III. Colombia.	IV. Venezuela.	V. Western Ecuador.	VI. Guiana.	VII. Lower Amazonia.	VIII. Upper Amazonia.	IX. Bolivia.	X. S.E. Brazil.	XI. Int. Brazil.
<i>Urogalba paradisea</i>	*	*				
<i>Urogalba amazonum</i>	*			
<i>Galbula viridis</i>	*	*	*			
<i>Galbula rufoviridis</i>	*	*	*
<i>Galbula ruficauda</i>	*	*	*					
<i>Galbula melanogenia</i>	*	*	*†						
<i>Galbula albirostris</i>	*	*	*			
<i>Galbula cyaneicollis</i>	*				
<i>Galbula leucogastra</i>	*	*				
<i>Galbula chalcothorax</i>	*			
<i>Brachygalba lugubris</i>	*	*	*	*			
<i>Brachygalba goeringi</i>	*						
<i>Brachygalba salmoni</i>	*							
<i>Brachygalba albigularis</i>	*			
<i>Brachygalba melanosterna</i>	*	*
<i>Jacamaralcyon tridactyla</i>	*	
<i>Galbalcyrrhynchus leucotis</i>	*			
<i>Jacamerops grandis</i>	*	*	*	*	*	*			
	1	2	4	5	1	7	6	7	2	2	2

† See Postscript, p. xliii.

VI. *Structure of the Puff-birds.*

I am again indebted to Mr. Forbes for the whole of the subjoined notes upon the structure of the *Bucconidæ*.

a. *External Features and Pterylosis**.

The nostrils are much as in the *Galbulidæ*, with a large operculum, and forwardly directed setæ, continuous behind with the rictal series, but shorter than those in the allied family. There are apparently eyelashes, which, however, have more the form of feathers than they have in the *Galbulidæ*.

The feet are stronger than those of the *Galbulidæ*, but essentially similar in construction, having both the first and fourth digits permanently reversed. The anterior semicircumference of the tarsi is covered with transverse scutellæ; behind they have two series of quadrangular scales in contact with each other along the median line. The second digit is united with the third, but less intimately than in the *Galbulidæ*, the union not extending beyond the first phalanx of the digits.

The oil-gland is nude†. There are twelve rectrices, the outer pair of about the same length as their fellows. The number of remiges seems to be twenty-two or twenty-three, of which ten are always primaries. As in the *Galbulidæ*, the "first" of these is much shorter than the others. The contour-feathers have *no* aftershaft.

Nitzsch has described‡ the pterylosis of *Bucco collaris*, *B. chacuru*, and *B. tamatia*, as well as that of *Malacoptila fusca*, and given figures in the case of the last two species. The tracts are all narrow, but the feathers on them strong and closely inserted. It is unnecessary to describe the arrangement of the tracts in detail, as it almost precisely corresponds with that of the *Galbulidæ* already described. The main differences between the two are:—

1. The absence of an aftershaft.
2. The absence of an internally directed "gular" branch from the pectoral tract.
3. The much clearer break between the anterior and posterior portions of the dorsal tract, there being a considerable space between the two, with no connecting series of feathers.
4. The greater length of the united part (or "handle") of the posterior fork.
5. The somewhat wider nature of the tracts.

b. *Visceral Anatomy.*

Of the visceral anatomy of the *Bucconidæ* all we at present know is that they have a capacious œsophagus, a fairly thick-walled muscular gizzard, no gall-bladder, and a short intestine, provided with the long, globose cæca characteristic of all the allied groups of birds.

* I have unfortunately as yet only been able to examine skins of this group. The following notes are based chiefly on an examination of *Bucco maculatus*; but I have compared imperfect skins of *Monacha panamensis*, *M. flavirostris*, and *Chelidoptera tenebrosa*.—W. A. F.

† Nitzsch (*infra cit.* p. 95) describes it as having "a few fine hairs at the apex" in *Malacoptila fusca*. These I have been unable to detect in any species examined by me.

‡ Pterylography, Ray Soc. ed. pp. 94, 95, pl. v. figs. 9, 10, 11.

For these facts we are indebted to Burmeister's examination of *Malacoptila torquata* and *Chelidoptera brasiliensis**.

The tongue, I may add (from an examination of this organ in a skin of *Bucco maculatus* where it has been fortunately preserved), closely resembles that of the Galbulidæ, being equally long (1 inch) and thin, tapering apically, with its lateral margins entire, and a spinose base.

The late Professor Garrod was able to determine, from a skin, that the distribution of the plantar tendons in *Monacha flavirostris* resembles that of the Pici and of the Galbulidæ, as described above, except that the vinculum between the two tendons is situated somewhat lower down, close to where the hallux tendon splits up for distribution. The same is the case in *Malacoptila fusca* and *Bucco maculatus*.

c. Osteology.

Like that of the Galbulidæ, the osseous structure of the Bucconidæ has only been very cursorily treated of by writers on the osteology of birds. For what has been recorded of it we are indebted to the same authorities as in the former case.

Blanchard † has described and figured the sterna of *Bucco maculatus* and *B. swainsoni*.

Eyton ‡ has briefly described, with measurements, the osteology of *Bucco swainsoni*, *Malacoptila torquata*, and *Chelidoptera tenebrosa*, with figures of the sternum (pl. viii. fig. 4) and palatine bones (pl. xii. fig. 4) of the last-named bird, and one of the entire skeleton of the first (pl. vii. B). He compares them with "*Capito*" (i. e. *Trachyphonus*) *purpuratus*.

Huxley § has briefly described the palate of a *Bucco* (the species is not mentioned, but from the description it appears to be one of the Bucconidæ as opposed to the Capitonidæ), which he shows to be desmognathous, and similar to that of *Geococcyx* and *Galbula*.

It is again owing to the generosity of Mr. Salvin that I am enabled to describe the osteology of the group in the present place, he having placed at my disposal skeletons of four species belonging to as many genera, namely, *Bucco dysoni*, *Malacoptila torquata*, *Micromonacha lanceolata*, and *Monacha nigrifrons*.

That of *Bucco dysoni* will be here described, the other species mentioned agreeing closely with it in most respects.

The rostrum is immovably united to the cranium; and both the interorbital and internasal septa are well ossified, being separated, however, by a well-marked "cranio-facial" notch. The alinasal cartilages are largely ossified, uniting with the median nasal septum and with the external processes of the nasals, as also with the spongy and swollen maxillo-palatine processes. The Bucconidæ are thus perfectly desmognathous. The palatines are short, and close to their union with the maxillæ are marked by an oblique ridge directed backwards and outwards. Behind this they have in section a completely triradiate form, the horizontal lamina of each side, which forms the main part of the bone and terminates posteriorly by an abruptly truncated margin, sending off perpendicularly from its median edge ascending and descending processes. The ascending process embraces the lower margin of the basisphenoidal rostrum, and is ankylosed firmly behind with the inner edge of the pterygoid, the two bones becoming

* Syst. Ueb. Th. Bras. ii. pp. 282, 292, 295.

† Ann. Sc. Nat. ser. 4, Zool. xi. p. 125, t. 5. figs. 19-23.

‡ Ost. Avium, pp. 47, 48, 64.

§ P. Z. S. 1867, p. 444.

completely fused with each other. The descending process is thickened at its lower (free) edge, and anteriorly incurved, so as to just meet its fellow of the other side. The bones, however, though in contact, do not fuse. Between the palatines may be seen the vomer, which is a strongly compressed vertical bone, deeper anteriorly than posteriorly, and terminating in a sharp oblique edge just behind the bridge formed by the union of the maxillo-palatines. The pterygoids are straight, cylindrical externally, but becoming dilated and compressed internally, the ascending part of each becoming completely fused with the ascending process of the palatines. There are no basiptyergoid tracts. The foramen magnum looks more directly downwards than in the Galbulidæ. The postorbital process is very strong, and connected by fibrous tissue with the malar. The space between it and the quadrate is divided by a sharp, forward and downwardly directed osseous spine. The lachrymals are firmly ankylosed to the nasals; and their descending process, which below joins the maxilla and malar at their union, is separated by only a narrow chink from the spongy ectethmoids. The end of the quadrate has two distinct articular facets, the inner one globose and strongly convex, the outer nearly longitudinal in direction and nearly flat.

The symphysis mandibulæ is much shorter than in the Galbulidæ, not exceeding one third of the total length of the rami. There is a strong angular process, directed inwards and upwards, with a truncated triangular posterior face and pointed apex.

There are fourteen cervical vertebræ. The atlas is nearly triangular in shape, viewed from front, the apex of the triangle being the articular cup. The fifth, sixth, and seventh cervical vertebræ have the anterior zygapophyses connected with the transverse processes by a narrow bony ridge. The last two (thirteenth and fourteenth) have good cervical ribs. There are four dorsal vertebræ; so that the total number of præsacral vertebræ is eighteen, of which the last becomes ankylosed to the sacral mass. The last cervical, as well as the three true ribs defined as such by articulating with the sternum directly, have uncinatè processes. All four dorsal vertebræ have distinct median hypapophyses, of which the anterior are bifurcated below, like the three preceding ones on the cervical vertebræ*. There are twelve sacral and five free caudal vertebræ, making a total of thirty-five vertebræ, neglecting the pygostyle, which is conical, truncated posteriorly, and has distinct transverse processes.

The sternum † much resembles that of the Galbulidæ. The costal processes are longer, and have only three articular faces for the ribs. The posterior notches are deeper, the manubrium longer and more distinct from the carina sterni, and the external xiphoid processes more divergent at their origin from the internal and from the body of the sternum. The coracoids are long, and but little divergent. The clavicles are expanded at their scapular ends, as in the Galbulidæ. They are convex forwards and somewhat twisted on their axes; when viewed from before, the united bones are V-shaped. At their symphysis is developed a strong backwardly directed hypocleidium, similar to that in the Passeres‡.

* In this specimen, as also to a less extent in the others examined, the hypapophyses of the last three cervical vertebræ are unsymmetrical, the left of the two processes, in which they terminate inferiorly, being itself furcate owing to the development on it of a small descending process. This is absent altogether on the right side.

† For figures of this bone in the Bucconidæ, *vide* the plates of Blanchard and Eyton, already quoted.

‡ The absence of this process is given by Professor Huxley (P. Z. S. 1867, p. 466) as one of the characters of his "Coceygomorphæ." But a similar process, it may be observed, exists in the Trogonidæ, though it is there of smaller size.

The ilia anteriorly are short, obliquely everted, and separated mesially by the coalesced neural vertebral spines. The antitrochanter is prominent; and from it the strongly marked "postacetabular" ridge is prolonged backwards to the well-marked posterior sacral spines. The ilio-sciatic foramen is oval, the notch well marked and deep. The obturator notch is largely ossified, so that its most anterior part is separated off as a small circular foramen. The renal fossæ are large, expanded, and not deep.

The first metacarpal has a well-developed tubercular process; and the first phalanx of the third digit articulates with the corresponding phalanx of the index, as in the Galbulidæ.

The cnemial process of the tibia is weak. There is an osseous bridge for the *extensor communis digitorum*. The tarso-metatarsus is carinated anteriorly, and has a small "calcaneal" process posteriorly, with grooves for the plantar tendons. Its length about equals the second digit, falling considerably short of that of the three basal joints of the third. The external articular trochlea is large and transverse, and directed backwards for the reversed fourth toe. The second digit is more feebly developed than its fellows.

The other species examined by me hardly differ in any characters of importance from *Bucco dysoni*. They have the lachrymals unconnected to the nasals, no conspicuous palatine ridges, and more ossification in the region of the internasal septum. In *Malacoptila* the palatine ridges are co-ossified anteriorly, whilst in *Micromonacha*, on the other hand, they are quite separate in that position. *Monacha* has the angular process of the mandible weaker. In all three forms the obturator notch is also less extensively ossified. As will be seen by the subjoined table, the number of vertebræ, as well as their grouping, varies, though the præsacral vertebræ are always eighteen.

	Cervical.	Dorsal.	Sacral.	Caudal.	Total vertebræ.	Ribs articulated with sternum.
<i>Bucco dysoni</i>	14	4	12	5	35	3
<i>Monacha nigrifrons</i>	14	4	11	5	34	3
<i>Malacoptila fusca</i>	13	5	11	6	35	4
<i>Micromonacha lanceolata</i>	14	4	12	5	35	3

All these forms have two distinct cervical ribs. *Malacoptila* differs from the others in having five dorsal vertebræ, the last *two* of which are fused with the "sacral" ones, and six caudals. There are uncinate processes on the last cervical and three anterior dorsal vertebræ in all the species except *Malacoptila*, where the anterior dorsal alone are provided with such appendages. *Micromonacha*, like *Bucco*, has inferior spinous processes (hypapophyses) on all four dorsal vertebræ. In *Malacoptila* these are confined to the first two, whilst in *Monacha* they are present on the first dorsal alone.

VII. *History of the Puff-birds.*

The history of the Puff-birds need not be commenced before Brisson, who, in the fourth volume of his excellent 'Ornithologie,' published in 1760, invented the generic term *Bucco* (from *bucca*, a cheek*), and arranged in it three species—one belonging to the family now treated of, and two to the family usually called Capitonidæ. As, however, Brisson placed the bird of this family first, and called it simply "*Bucco*," and as, moreover, Linnæus, in his 12th edition of his 'Systema Naturæ,' constituted *his* genus "*Bucco*" of this same species alone, I think there can be no doubt whatever that it is correct to retain the name *Bucco* for the leading group of this family, and not to use it for the Capitonidæ, as has been done by some writers.

Buffon (1780) applied the term *Tamatia* to the present group, in which, however, he included the Capitonidæ of the New World, and used the name "*Barbu*" for the Capitonidæ of the Old World.

Gmelin (1788), in his edition of the 'Systema Naturæ,' mixed up all the Bucconidæ and Capitonidæ known to him in his genus *Bucco*. Of the seventeen species which he attributes to *Bucco*, six only properly belong to this family—namely, *B. tamatia*, *B. capensis* (i. e. *B. collaris*), *B. macrorhynchus*, *B. melanoleucus* (i. e. *B. tectus*), *B. fuscus* (i. e. *Malacoptila fusca*), and *B. cinereus* (i. e. *Monacha nigra*). Besides these, Gmelin placed one Bucconine bird in the genus *Alcedo* (sc. *Bucco maculatus*), and another in the genus *Cuculus* (sc. *Chelidoptera tenebrosa*). It may be said, therefore, that at this period eight species of Bucconidæ were known to science.

Ten years later Latham, in his 'Index Ornithologicus,' did not advance at all upon Gmelin's arrangement. His nineteen species of *Bucco* are likewise a mixed multitude, of which only six properly pertain to the present group.

A much more intelligent writer treated of the Bucconidæ (as we now call them) in 1806. François Levaillant introduced this group into the second volume of his 'Oiseaux de Paradis,' separating them from the Barbus (Capitonidæ) under the name "*Barbus Tamatias*," and constituting a second genus of *Monacha* and *Chelidoptera* under the title "*Barbacous*." In his volume and in the Supplement to it Levaillant described and figured all together seven of these birds.

After Levaillant there is little noteworthy in the history of the Barbets until we come to Vieillot, who in 1816, in his 'Analyse d'une nouvelle Ornithologie,' placed the Barbets in two genera—*Bucco* and *Monasa* (corr. *Monacha*) in his family BARBATI, separating them both from *Capito*, which, as here given, becomes the first name available for the rival family Capitonidæ†. In his articles in the 'Nouveau Dictionnaire' ("*Barbu*" and "*Monase ou Barbacou*") published shortly afterwards, Vieillot recognized four species of the first genus and two of the second, besides various bad species. The only species added to those of previous authors, however, was his *Bucco chacuru* (from Azara's El Chacuru). In his 'Encyclopédie Méthodique' Vieillot made very few alterations in this arrangement.

Neither Latham, in his 'General History' (1822), nor Lichtenstein, who issued his 'Doubletten-

* "Nomen a me huic generi impositum, a *buccarum* sive genarum et capitis crassitie" (Brisson, Orn. iv. p. 91).

† Temminck, in his "Analyse du Système Général," prefixed to the 'Manuel d'Ornithologie,' used Vieillot's name "*Capito*" for the Puff-birds, and "*Bucco*" for the Barbets, and thus much increased the confusion on this subject.

Verzeichniss' in 1823, distinguished between the *Bucconidæ* and *Capitonidæ*. All species of these families known to these two authors were lumped together as "Barbets" by the former, and under "*Bucco*" by the latter. In 1827, however, the more accurate Wagler took up the subject, and clearly separated the groups. Unfortunately, misled by Temminck, Wagler called the Puff-birds "*Capito*," but gave an excellent account of the seven species known to him. Instead of adopting Vieillot's name, he likewise termed the Nun-birds *Lypornix*, but well and concisely described seven species of this group also, except that he treated *Malacoptila fusca* as the young of *M. torquata*, and changed one or two previously given names. On the whole, however, Wagler's essay must be regarded as by far the best account of the group given up to this period, at which epoch fifteen species were known to science.

In his 'Traité d'Ornithologie' (1831) Lesson arranged the Puff-birds in two genera of his family "Barbus"—Barbacou (*Monasa*) and Tamatia (*Tamatia*), and kept them distinct from the *Capitonidæ*. Of the former group he mentioned four species, of the latter eight, thus clearly falling short of Wagler in his knowledge of the group.

The immortal Nitzsch, whose researches were published by Burmeister in 1840, placed the Puff-birds amongst his "*Picinae*," and first described their pterylographic characters. He had examined the pterylosis of two genera—*Bucco* and *Monacha**.

We may now pass on, I think, omitting notices of individual descriptions, to the year 1846, in which Messrs. Gray and Mitchell issued the number of their standard work, on the Genera of Birds, containing the Puff-birds. In this work the groups in question are arranged as the first subfamily of the *Alcedinidæ*, under the title of "*Bucconinae*." It is to Gray, in fact, that we are indebted for the restoration of the term "*Bucco*" to its proper use, from which it had been so long divorced. Even in his two editions of his 'List of the Genera of Birds' (1840 and 1841) Gray had not ceased to follow the prevalent usage, calling the Puff-birds "*Tamatianæ*" and the Barbets "*Bucconinae*." But in the 'Genera of Birds' he restored the misused terms to their proper application, calling the Puff-birds "*Bucconinae*" and the Barbets "*Capitoninae*," in which excellent revolution he has been followed by nearly every subsequent writer of repute. Gray, in the 'Genera,' allowed three genera of *Bucconinae*—*Bucco*, *Monasa*, and *Chelidoptera*—assigning thirteen species to the first genus, seven to the second, and one to the third. One of the *Buccones* being given twice under different names, we may consider that twenty species of the group were at this epoch known to science, of which two were first named by Gray in the present work, and one of these (*Bucco pectoralis*) excellently figured.

Two years later (1848) Gray issued his 'List of the Specimens of Fissirostres' in the British Museum, in which he did not deviate from the foregoing arrangement. It seems that the national collection contained at that period thirty-seven examples of *Bucconidæ*, belonging to sixteen species.

In 1850 Bonaparte published the portion of his 'Conspectus' that contains the Puff-birds. In this most useful compilation the author accorded the group the full rank of a family, which Strickland had claimed for it in his "Commentary" upon Gray's Lists†, but persisted in terming it *Capitonidæ*. Twenty-four species were assigned to the group.

Shortly after this period I first took up the study of the *Bucconidæ*, and in 1854 published

* 'Pterylography' (Engl. ed.), p. 94.

† Ann. Nat. Hist. vi. p. 417 (1841).

a memoir on the subject in the 'Annals and Magazine of Natural History'*. In this essay I divided the family into four genera (*Bucco*, *Malacoptila*, *Monasa*, and *Chelidoptera*), and described thirty-three species as known to me.

In the list of Puff-birds contained in his 'Conspectus Volucrum Zygodactylorum,' published in the same year, Bonaparte enumerated thirty-one species under nine generic heads. Five of these were new names, of which no descriptions were given, and the author still continued to miscall the family "Capitonidæ."

In 1855, when describing some additional species of this group before the Zoological Society of London, I took the opportunity of giving a geographical table of the species known to me†. These were thirty-one in number, arranged in five genera, one being added to those adopted in my 'Synopsis.'

In the following year Herr v. Pelzeln gave an account of the species of this family met with by the celebrated collector Natterer in his Brazilian travels. These were no less than twenty in number, concerning each of which excellent notes on the colours of the soft parts and other peculiarities recorded in Natterer's MS. journal are given. Two species were described as new, but one of them had, in fact, been just previously named in another quarter. In the same year (1856) Burmeister published the second volume of his 'Systematische Uebersicht der Thiere Brasiliens.' Burmeister arranged the Puff-birds next to the Trogons, and included in his work thirteen species (as Brazilian) divided into three genera. Some good notes on the internal structure of these birds were also given.

In the Catalogue of the American Birds in my collection, published in 1862, I gave a list of my specimens of Bucconidæ. At that time they were fifty-four in number, referable, according to my views at that date, to thirty-nine species.

In the succeeding year (1863) Messrs. Cabanis and Heine gave a full account of the Bucconidæ in the section of the 'Museum Heineanum' devoted to the Scansores. Here the family, arranged between the Cuculidæ and the Trogonidæ, is divided into eleven genera, containing altogether fifty species.

In his useful 'Hand-list' (1869) Gray placed the Bucconidæ as a family of Fissirostres, between the Trogons and Kingfishers, and gave a list of fifty-one described species, referred to three genera.

Finally, in 1870, Mr. Salvin and I catalogued the Puff-birds known to us in our 'Nomenclator Avium Neotropicalium.' We here recognized forty-three species, divisible into five genera. To these species I added one, and to these genera two, in a paper read before the Zoological Society of London in June last year, "On the Generic Divisions of the Bucconidæ." I may add that the series of specimens of this group now in my collection consists of 130 individuals, referable to 39 species, while that of my friends Salvin and Godman embraces 167 individuals, belonging to 38 species. Upon these two collections the present monograph has been entirely based, the only deficiency in the united series being *Nonnula cineracea*, of which the unique specimen is in the British Museum.

* This memoir was shortly afterwards reprinted as a separate work, accompanied by four coloured plates, and published by S. Highley, of Fleet Street. It is quoted in the present work as 'Syn. Bucc.,' i. e. 'Synopsis of the Bucconidæ.'

† See P. Z. S. 1855, p. 196.

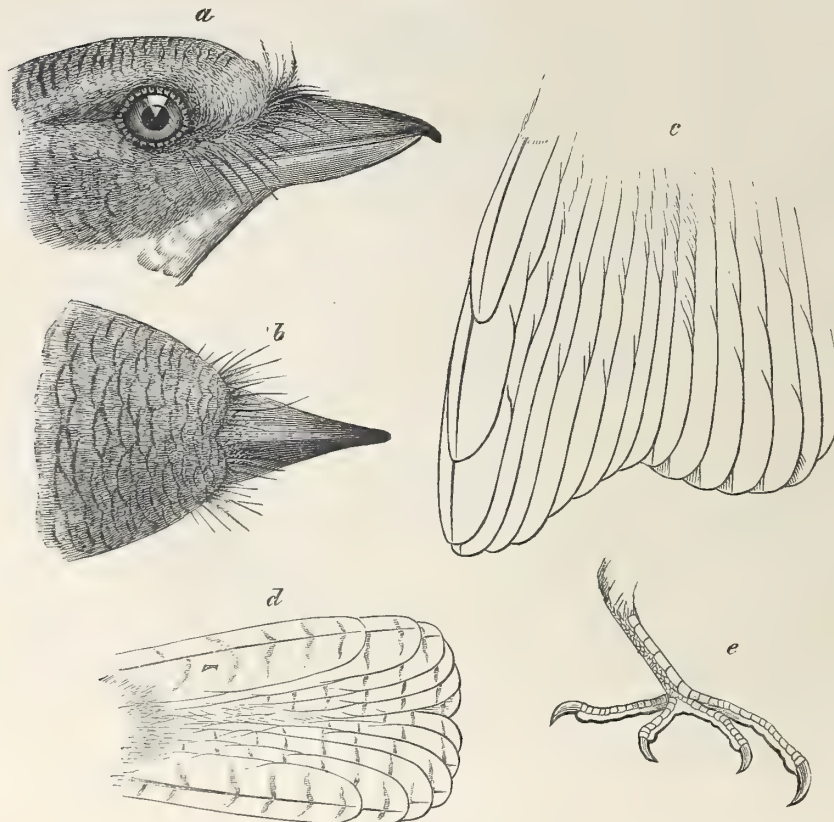
VIII. *Classification of the Puff-birds.*

The Puff-birds cannot, I think, be naturally divided into subfamilies, but fall into seven genera, which may be shortly distinguished as follows:—

- A. Rostrum rectum ad basin dilatatum, apice uncinato 1. *Bucco*.
- B. Rostrum modicè incurvum, compressum, apice (nisi in *Hapaloptilâ*) non uncinato.
 - a. Caudâ rotundatâ.
 - a. Alis brevibus.
 - a'. Rostro breviori incrassato,
 - caudâ modicâ 2. *Malacoptila*.
 - caudâ brevi 3. *Micromonacha*.
 - b'. Rostro longiore tenui 4. *Nonnula*.
 - b. Alis elongatis.
 - Rostro uncinato, caudâ breviori 5. *Hapaloptila*.
 - Rostro leviter incurvo, caudâ elongatâ 6. *Monacha*.
 - b. Caudâ brevi quadratâ 7. *Chelidoptera*.

Genus I. BUCCO.

Fig. 7.

*Bucco collaris.*

- a. Bill, from side. b. Bill, from above. c. Wing-end, from within. d. Tail-end, from below.
- e. Left foot, from inside.

	Type.
<i>Bucco</i> , Briss. Orn. iv. p. 92 (1760)	<i>B. collaris</i> .
<i>Cyphos</i> , Spix, Av. Bras. i. p. 51 (1824)	<i>B. macrodactylus</i> .
<i>Nystactes</i> , Gloger, Froriep's Notizen, xvi. p. 277 (1827)	<i>B. tamatia</i> .
<i>Tamatia</i> , Less. Trait. d'Orn. p. 166 (1831)	<i>B. tectus</i> .
<i>Chaunornis</i> , G. R. Gray, List of Gen. p. 13 (1841)	<i>B. tamatia</i> .
<i>Nystalus</i> , Cab. et Hein. Mus. Hein. iv. p. 139 (1863)	<i>B. maculatus</i> .
<i>Hypnelus</i> , Cab. et Hein. Mus. Hein. iv. p. 143 (1863)	<i>B. bicinctus</i> .
<i>Nothriscus</i> , Cab. et Hein. Mus. Hein. iv. p. 146 (1863)	<i>B. tectus</i> .
<i>Argicus</i> , Cab. et Hein. Mus. Hein. iv. p. 148 (1863)	<i>B. macrodactylus</i> .
<i>Notharchus</i> , Cab. et Hein. Mus. Hein. iv. p. 149 (1863)	<i>B. hyperrhynchus</i> .

CHAR. GEN. Rostrum rectum, capitis longitudine aut eodem vix longius, validum, intumidum, ad basin dilatatum, apice uncinato; nares basales, vibrissis frontalibus obtectæ; alæ breves rotundatæ, remigibus tertio quarto et quinto longissimis, primum fere duplò superantibus; cauda modice rotundata, rectricibus xii.; pedes scansorii, digito primo et secundo congruis, digito secundo omnium longissimo.

This large genus, as suggested by Wagler, may be divided into two subgenera, distinguished by the form of the bill, as follows:—

Rostro rotundato ad basin dilatato	1. <i>Bucco</i> .
Rostro compresso et magis elevato	2. <i>Nystalus</i> .

The first subgenus (*Bucco*) comprehends fifteen species, which may be separated as follows:—

A. Species subtus nigro torquatæ.

- a. Albo-rufæ, rostro rubro 1. *B. collaris*, p. 61.
- b. Albo-nigræ, rostro nigro.
 - a'. Majores; pileo nigro.
 - a'''. Torque pectorali nigro.
 - a'''. Fronte et ventre albis,
 - fronte modico albo 2. *B. macrorhynchus*, p. 65.
 - fronte latiore albo 3. *B. dysoni*, p. 67.
 - fronte latissimo albo. 4. *B. hyperrhynchus*, p. 71.
 - b'''. Fronte albo, ventre rufescente 5. *B. swainsoni*, p. 73.
 - c'''. Fronte nigro, ventre albo 6. *B. pectoralis*, p. 75.
 - b''. Torque pect. nigro et brunneo 7. *B. ordi*, p. 77.
 - b'. Minores; pileo albo punctato.
 - c''. Torque pect. lato,
 - rectr. vi. mediis maculatis 8. *B. tectus*, p. 79.
 - rectr. vi. mediis immaculatis 9. *B. picatus*, p. 81.
 - d''. Torque pect. angusto 10. *B. subtectus*, p. 83.
- c. Fusco-rufæ, rostro nigro.
 - c'. Pileo castaneo 11. *B. macrodactylus*, p. 85.
 - d'. Pileo fusco,
 - torque pect. unico 12. *B. ruficollis*, p. 89.
 - torque pect. duplici 13. *B. bicinctus*, p. 91.

B. Species subtus non torquatæ.

- d. Ventris maculis nigris 14. *B. tamatia*, p. 93.
- Ventris maculis nigris crebrioribus 15. *B. pulmentum*, p. 97.

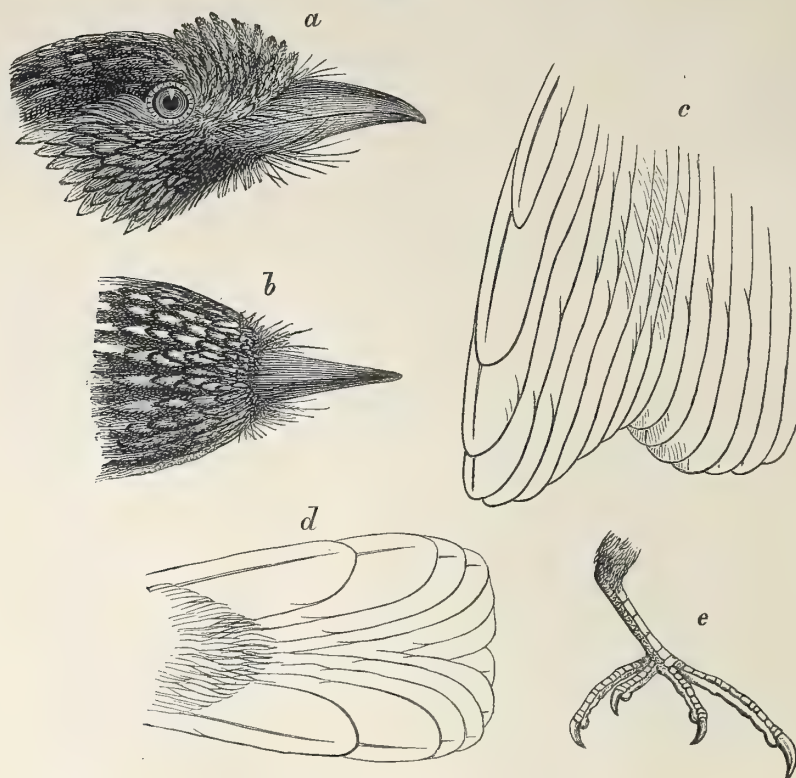
The second subgenus (*Nystalus*) contains the five remaining species, which may be thus distinguished:—

- | | |
|--|---------------------------------------|
| A. Pectore rufescente, puro, | |
| ventre albo, nigro maculato | 16. <i>B. maculatus</i> , p. 99. |
| ventre albo, nigro striolato | 17. <i>B. striatipectus</i> , p. 101. |
| B. Pectore albo, puro | 18. <i>B. chacuru</i> , p. 103. |
| C. Pectore rufescente, variegato, | |
| ventre nigro striolato | 19. <i>B. striolatus</i> , p. 107. |
| ventre nigro transradiato | 20. <i>B. radiatus</i> , p. 109. |

Genus II. MALACOPTILA.

Genus II. MALACOPTILA.		Type.
<i>Malacoptila</i> , Gray, List of Gen. p. 13 (1841)		<i>M. fusca</i> .

Fig. 8.



Malacoptila fusca.

a. Bill, from side. *b.* Bill, from above. *c.* Wing-end, from within. *d.* Tail-end, from below.
e. Left foot, from within.

CHAR. GEN. Rostrum paulo incurvum, capitis longitudine, debilius et magis compressum quam in *Buccone*, apice magis incurvato sed vix uncinato; nares basales, vibrissis frontalibus obtectæ; aliter sicut in genere præcedente, sed caudâ magis rotundatâ.

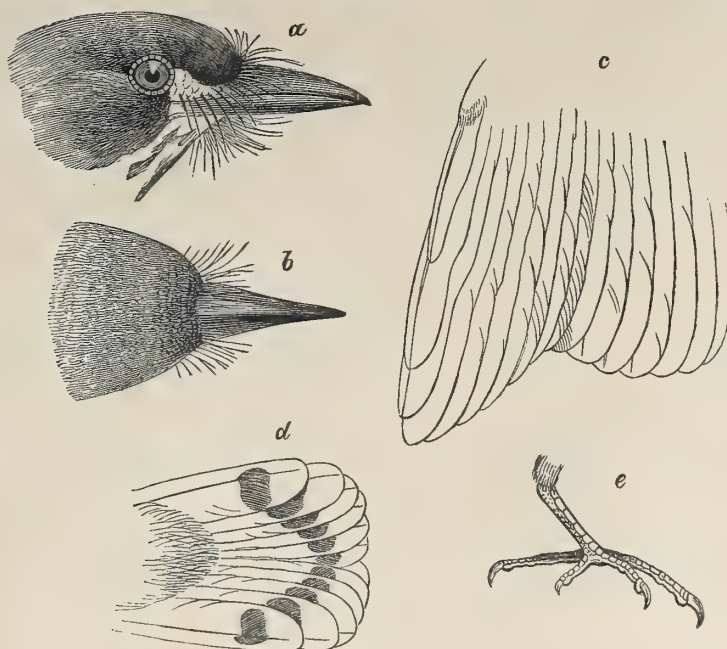
Seven species, according to my judgment, may be recognized in this genus, as set out in the subjoined diagnostic table:—

- A. Plagâ pectorali albâ,
pileo nigricante, fusco striato 1. *M. fusca*, p. 111.
pileo cinereo, rufo circumdato 2. *M. rufa*, p. 115.
- B. Plagâ pectorali albâ, inde torque nigra 3. *M. torquata*, p. 117.
- C. Plagâ pectorali nullâ, gutture rufo aut rufescente.
- a. Pileo non striato,
pectore fusco striato 4. *M. panamensis*, p. 119.
pectore ferè unicolori 5. *M. inornata*, p. 125.
- b. Pileo distinctè striato,
ventre distinctè striato 6. *M. fulvicularis*, p. 127.
ventris striis obsoletioribus 7. *M. substriata*, p. 129.

Genus III. MICROMONACHA.

Genus III. MICROMONACHA.	Type.
<i>Micromonacha</i> , Scl. P. Z. S. 1881, p. 777	<i>M. lanceolata</i> .

Fig. 9.



Micromonacha lanceolata.

a. Bill, from side. *b.* Bill, from above. *c.* Wing-end, from within. *d.* Tail-end, from below.
e. Left foot, from within.

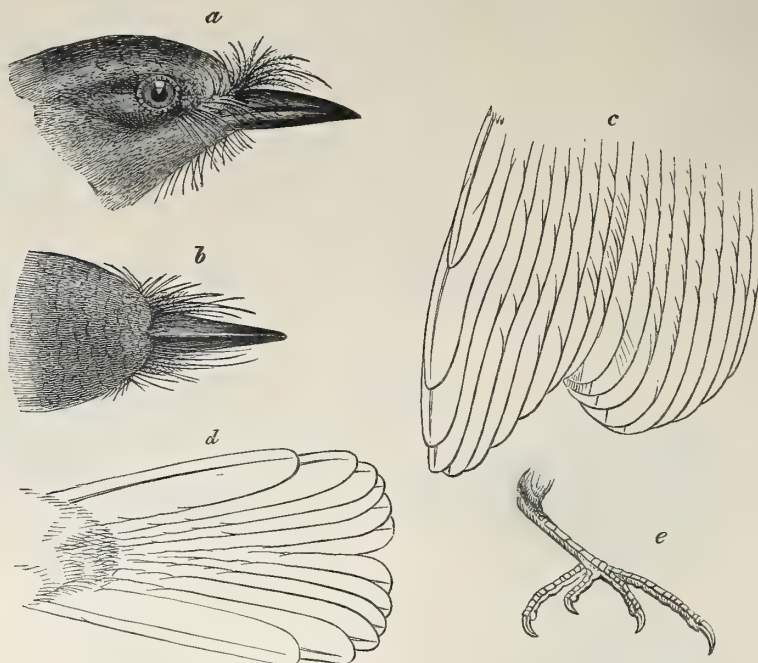
CHAR. GEN. *Malacoptilæ*, sed caudâ brevior, et rostro debiliore et magis compresso.

This is a monotypic form, represented only by *M. lanceolata*, p. 131.

Genus IV. NONNULA.

Nonnula, Scl. P. Z. S. 1853, p. 124 Type.
N. rubecula.

Fig. 10.

*Nonnula rubecula*.

a. Bill, from side. b. Bill, from above. c. Wing-end, from within. d. Tail-end, from below.
 e. Left foot, from inside.

CHAR. GEN. Rostrum *Malacoptilæ* sed magis rectum, tenue et elongatum, ad basin vix incrassatum; alæ breviores; cauda elongatior; pedes debiliores.

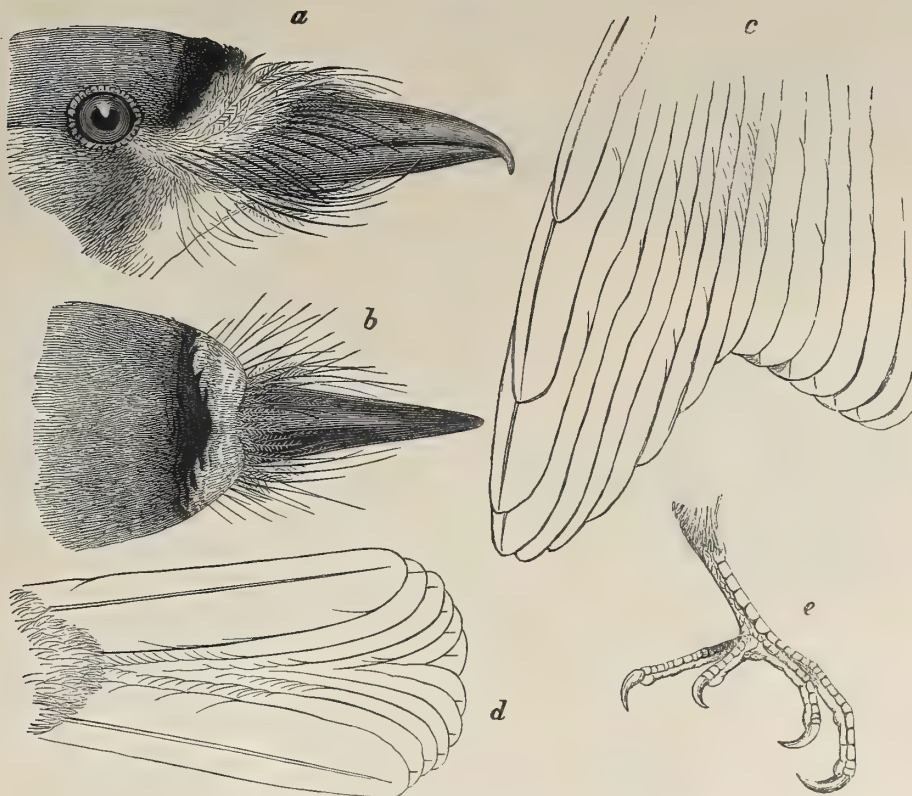
Of this most diminutive form of the whole family, five closely allied species may be distinguished as follows:—

- | | |
|--|------------------------------------|
| A. Pileo cineraceo, loris et reg. oculari albis, | |
| pectore rufescente | 1. <i>N. rubecula</i> , p. 133. |
| pectore valde dilutius | 2. <i>N. cineracea</i> , p. 135. |
| B. Pileo castaneo | 3. <i>N. ruficapilla</i> , p. 137. |
| C. Pileo rufescente, in dorsi | |
| colorem transeunte | 4. <i>N. frontalis</i> , p. 139. |
| D. Pileo brunneo, dorso concolori | 5. <i>N. brunnea</i> , p. 141. |

Genus V. HAPALOPTILA.

Hapaloptila, *Scl. P. Z. S.* 1881, p. 777 Type.
H. castanea.

Fig. 11.

*Hapaloptila castanea*.

a. Bill, from side. *b.* Bill, from above. *c.* Wing-end, from within. *d.* Tail-end, from below.
e. Left foot, from inside.

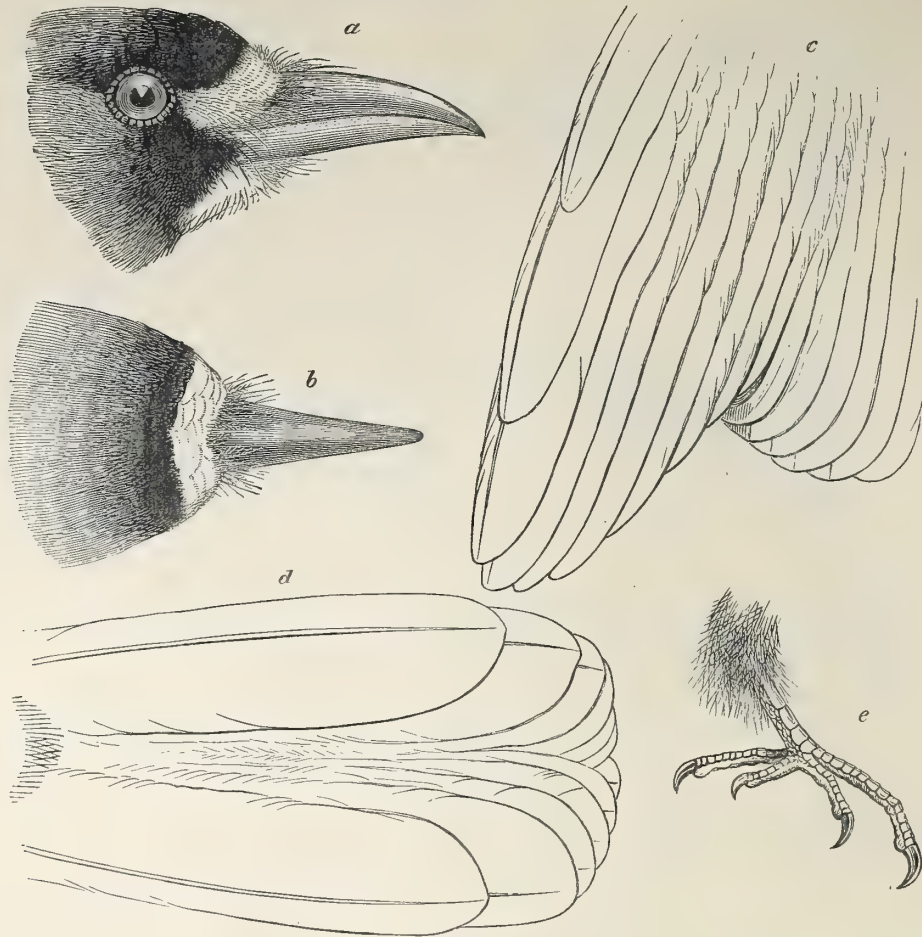
CHAR. GEN. Rostrum ferè rectum, validum et fortiter uncinatum, capitis longitudinem superans, setis omninò obsitum; cauda modica; pedes fortiusculi.

This is another monotypic genus, represented only by *H. castanea*, p. 143.

Genus VI. MONACHA.

	Type.
<i>Monasa</i> *, Vieill. Analyse, p. 27 (1816)	<i>M. nigra</i> .
<i>Lypornix</i> , Wagler, Syst. Av. (1827)	<i>M. nigra</i> .
<i>Scotocharis</i> , Gloger, Froriep's Notizen, xvi. p. 277 (1827)	<i>M. nigra</i> .
<i>Monastes</i> , Nitzsch, Ptérylogr. p. 135 (1840)	<i>M. nigra</i> .

Fig. 12.

*Monacha peruana*.

a. Bill, from side. b. Bill, from above. c. Wing-end, from within. d. Tail-end, from below.
e. Left foot, from inside.

CHAR. GEN. Rostrum capite paulo aut vix brevius, subgracile, leniter incurvum, apice magis inflexo, compressum; nares sicut in *Buccone*, sed vibrissis densioribus obtectum; alæ longiusculæ, caudæ basin superantes, remigibus tertio quarto et quinto longissimis et primum duplo superantibus; cauda longiuscula, rotundata, rectricibus latis; pedes sicut in *Buccone*.

The seven species which I have recognized in this genus may be distinguished as follows:—

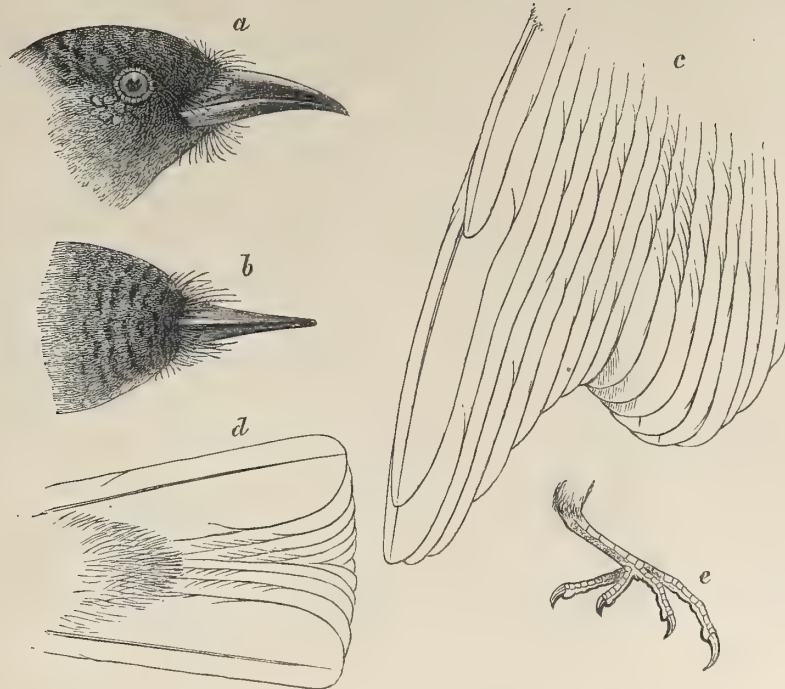
* "*Monasa*" of Vieillot I have ventured to correct into "*Monacha*," which is probably what the author of the term intended. Nitzsch has suggested "*Monastes*;" but that is more divergent from Vieillot's original term.

- A. Campterio alari albo, alâ extûs discolori,
 major; rostro rubro 1. *M. nigra*, p. 145.
 minor; rostro flavo 2. *M. flavirostris*, p. 149.
- B. Campterio et alis extus concoloribus.
 a. Fronte et gulâ albis,
 fronte et gulâ latiûs albis 3. *M. morpheus*, p. 151.
 fronte et gulâ angustiûs albis 4. *M. peruana*, p. 153.
 major; capite nigricantiore 5. *M. grandior*, p. 155.
 b. Fronte albâ, gulâ nigrâ 6. *M. pallescens*, p. 157.
 c. Fronte gulâque nigris 7. *M. nigrifrons*, p. 159.

Genus VII. CHELIDOPTERA.

Chelidoptera, Gould, P. Z. S. 1836, p. 81.

Fig. 13.



Chelidoptera tenebrosa.

- a. Bill, from side. b. Bill, from above. c. Wing-end, from within. d. Tail-end, from below.
 e. Left foot, from within.

CHAR. GEN. *Monachæ*, sed caudâ brevi quadratâ, et alis pro mole longioribus, necnon rostro minore, graciliore.

Of this genus but two species are known, distinguishable as follows:—

- Minor; ventre rufo 1. *C. tenebrosa*, p. 161.
 Major; ventre dilutiore, ochraceo 2. *C. brasiliensis*, p. 165.

IX. *Habits and Distribution of the Puff-birds.*

As in the case of the Jacamars, very little has as yet been written of the life and habits of the Puff-birds. All that I have been able to find recorded is given under the head of the species to which it relates. Speaking generally it may be said that the Puff-birds are a purely arboreal and forest-frequenting group. They seem to pass the greater part of their lives sitting upon the topmost or outermost branches of the trees, generally selecting twigs that are dry and withered for their perch, and looking out for insects, which are captured flying, and constitute their only food. The Swallow-wing (*Chelidoptera*) nests in holes in banks, like the Kingfishers, and lays white eggs. Of the mode of nidification of the other species of the family we are at present almost entirely ignorant; but it is probable that they either follow the same practice, or else nest in hollow trees, and that their eggs are colourless, like those of other birds which deposit their eggs in similar situations.

The distribution of the Puff-birds is shown in the subjoined Table. It may be observed that they do not go quite as far north as the Jacamars, no species of Puff-bird having been yet ascertained to occur in Mexico. On the other hand several species are found in Transandean Ecuador, where, so far as is yet known, but one Jacamar has penetrated; and a single *Bucco* ranges as far south as the forest-district of Paraguay, which is, I believe, outside the present known limits of the range of the *Galbulæ*. As with the Jacamars so with the Puff-birds, the stronghold of the group is the great forest-region of Amazonia. In Eastern Peru and the adjoining districts belonging to Brazil and Ecuador, which I have designated by the more general name of Upper Amazonia, no less than twenty-two species of the group are known to occur, while thirteen have been recorded from Lower Amazonia, and examples of the same number of species were obtained by a single collector in one district of the eastern portion of Ecuador. The interior of Colombia is likewise rich in *Bucconidæ*, twelve or thirteen species being met with in "Bogota" collections. North and south of what may be termed their "focus," these birds rapidly fall off in number of species, until in Guatemala we meet with but two and in Paraguay but one of these birds.

In the Patagonian and Antillean subregions, as in the case of the Jacamars, there are no *Bucconidæ*.

	TRANSPANAMIANIC SUBREGION.		COLOMBIAN SUBREGION.			AMAZONIAN SUBREGION.					BRAZILIAN SUBREGION.		
	I. Guatemala.	II. Costa Rica and Panama.	III. Colombia.	IV. Venezuela.	V. West Ecuador.	VI. Guiana.	VII. Lower Amazonia.	VIII. Upper Amazonia.	IX. Eastern Ecuador.	X. Bolivia.	XI. S.E. Brazil.	XII. Int. Brazil.	XIII. Paraguay.
<i>Bucco collaris</i>	*	*	*	*	...			
<i>Bucco macrorhynchus</i>	*	*	*	*	...			
<i>Bucco dysoni</i>	*	*	*	...	*	*		
<i>Bucco hyperhynchus</i>			
<i>Bucco swainsoni</i>			
<i>Bucco pectoralis</i>	*	*	*	*	*	...	*		
<i>Bucco ordi</i>	*	*	*	...			
<i>Bucco tectus</i>	*	*	*	...			
<i>Bucco picatus</i>	*	*	...			
<i>Bucco subtectus</i>	*	*	...	*	...	*	*	*	...			
<i>Bucco macrodactylus</i>	*	*	*	*	...			
<i>Bucco ruficollis</i>	*	*	*	...			
<i>Bucco bicinctus</i>	*	*	*	*	...			
<i>Bucco tamatia</i>	*	...	*	*	*	*	...			
<i>Bucco pulmentum</i>	*	...	*	*	...			
<i>Bucco maculatus</i>	*	*	...			
<i>Bucco striatipectus</i>	*	*	...			
<i>Bucco chacuru</i>	*	*	...			
<i>Bucco striolatus</i>	*	*	...			
<i>Bucco radiatus</i>	*	*	...	*	*	*	...			
<i>Malacoptila fusca</i>	*	*	...	*	*	...			
<i>Malacoptila rufa</i>	*	*	...	*	*	...			
<i>Malacoptila torquata</i>	*	*	...			
<i>Malacoptila panamensis</i>	*	*	...			
<i>Malacoptila inornata</i>	*	*	*	*	*	*	*	...			
<i>Malacoptila fulvularis</i>	*	*	...			
<i>Malacoptila substriata</i>	*	*	*	...			
<i>Micromonacha lanceolata</i>	*	*	...			
<i>Nonnulla rubecula</i>	*	*	...			
<i>Nonnulla cineracea</i>	*	*	*	...	*		
<i>Nonnulla ruficapilla</i>	*	*		
<i>Nonnulla frontalis</i>	*	*	*	*	*	
<i>Nonnulla brunea</i>	*	*	*		
<i>Hapaloptila castanea</i>	*	*		
<i>Monacha nigra</i>	*	*		
<i>Monacha flavirostris</i>	*	*	*	*	...	*		
<i>Monacha morpheus</i>	*	*	*	...	*		
<i>Monacha periana</i>	*	*	...	*		
<i>Monacha grandior</i>	*	*	*	...	*		
<i>Monacha pallescens</i>	*	*	*	...	*		
<i>Monacha nigrifrons</i>	*	*	*	...	*		
<i>Chelidoptera tenebrosa</i>	*	*	*	*	...	*		
<i>Chelidoptera brasiliensis</i>	*		
	2	7	14	3	4	7	13	22	13	4	7	4	1

X. *Postscript.*

Since the preceding Introduction was put into type I have acquired additional information on two interesting points as regards the Jacamars.

Messrs. Salvin and Godman have received from one of their correspondents, Mr. Joyner, at present on the Rio Clara, in the province of Goyaz, Brazil, specimens of *Galbula rufo-viridis* with an accompanying note calling their attention to the fact that this bird (which Mr. Joyner calls a Humming-bird, no doubt as being the "*Chupa-flor do Mato*" of the Brazilians) fishes in the forest-streams "like a Kingfisher." Mr. Joyner asserts that this Jacamar "catches small fishes in the water and eats them." This is certainly not impossible, but, if true, is quite a new fact in the economy of the Jacamars.

Messrs. Salvin and Godman have also recently added to their collection two skins of a Jacamar from the Balzar mountains, in Ecuador, which are referable to *Galbula melanogenia*. Not only does this fact show an unanticipated extension of the previously known range of the Central-American Jacamars, which had only previously been traced as far south as Chiriqui *, but it is of still greater interest as being the first instance of the occurrence of any species of Jacamar in Western Ecuador.

* See Mr. Salvin's remarks quoted, *infra*, p. 20.

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|---|---|



W. Woodhouse sculp.

Hanhart imp

1 TURDALEA PARADISEA
2 " AMAZONUM.

UROGALBA PARADISEA.

THE COMMON PARADISE-JACAMAR.

PLATE I. FIG. 1.

- The Swallow-tailed Kingfisher*, Edwards, Nat. Hist. B. i. p. 10 (1743).
Galbula longicauda, Briss. Orn. iv. p. 89 (1760).
Alcedo paradisea, Linn. Syst. Nat. i. p. 181 (1766).
Le Jacamar à longue queue, Buff. Hist. Nat. viii. p. 92, et Pl. Enl. 271 (1783).
Alcedo paradisea, Gm. Syst. Nat. i. p. 458 (1789).
Galbula paradisea, Lath. Ind. Orn. i. p. 245 (1790).
Le Jacamar à longue queue, Aud. et Vieill. Ois. Dor. i. Jac. t. 3 (1802).
Le Jacamar à longue queue, Levaill. Ois. de Par. ii. p. 120, t. 52 (1806).
Paradise Jacamar, Lath. Gen. Hist. iv. p. 5 (1822).
Galbula paradisea, Vieill. Enc. Méth. p. 1325 (1823).
Galbula paradisea, Gray et Mitch. Gen. B. i. p. 83 (1847).
Galbula paradisea, Cab. in Schomb. Guian. iii. p. 717 (1848).
Galbula paradisea, Gray, List of Fiss. B. M. p. 67 (1848).
Galbula paradisea, Bp. Consp. i. p. 153 (1850).
Galbula paradisea, Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 309 (1851).
Galbula paradisea, Cassin, Cat. Halc. p. 18 (1852).
Galbula paradisea, Reich. Handb. d. sp. Orn. p. 87 (1852).
Galbula paradisea, Scl. Contr. Orn. 1852, p. 33, et Syn. Galb. p. 80 (1852).
Urogalba paradisea, Bp. Consp. Vol. Zyg. p. 13 (1854).
Urogalba paradisea, Scl. P. Z. S. 1855, p. 14 (1855).
Galbula paradisea, Burm. Syst. Ueb. ii. p. 302 (1856).
Galbula paradisea, Pelz. Sitz. Ak. Wien, xx. p. 504 et p. 517 (1856).
Urogalba paradisea, Scl. Cat. A. B. p. 267 (1862).
Urocex paradisea, Cab. et Hein. Mus. Hein. iv. p. 217 (1863).
Urogalba paradisea, Scl. et Salv. P. Z. S. 1867, p. 582.
Galbula paradisea, Pelz. Orn. Bras. p. 24 (1871).
Urogalba paradisea, Scl. et Salv. Nomencl. p. 105 (1873).

Purpurascenti-nigra; dorso alis caudâque æneo lavatis; pileo et capitis lateribus cum mento summo fusciscentibus; gutture toto, subalaribus, remigum marginibus internis et hypochondriis albis; rostro et pedibus nigris: long. tota 11·5, alæ 3·5, caudæ 6·5, rostri a rectu 2·3. *Fem.* mari similis sed crassitie paulò minore.

Hab. in Guianâ, Surinamo, Cayennâ et Amazoniâ inferiore.

IN the days of Brisson and Buffon the birds of the French colony of Cayenne were well known
SCL. Jac. & Puffb. No. I.—October, 1879.

UROGALBA AMAZONUM.

THE LARGER PARADISE-JACAMAR.

PLATE I. FIG. 2.

Urogalba amazonum, Scl. P. Z. S. 1855, p. 14.

Urogalba amazonum, Scl. Ann. Nat. Hist. ser. 2, xvii. p. 71 (1856).

Urogalba paradisea, Scl. P. Z. S. 1857, p. 262.

Urogalba amazonum, Scl. et Salv. P. Z. S. 1867, p. 582.

Urogalba amazonum, Scl. et Salv. Nomencl. p. 105 (1873).

Obscurè purpureo-viridis, alis et caudâ extûs et dorso inferiore æneo splendentibus; pileo albicanti-fusco, fronte et supercilils dilutioribus; gutturis plagâ magnâ triangulari, subalaribus, remigum marginibus internis et hypochondriis albis; mento fusco; rostro et pedibus nigris: long. tota 13·0, alæ 3·8, caudæ 6·3, rostri a rictu 2·7. *Fem.* mari similis, sed crassitie minore.

Hab. in Amazonia superiore.

Obs. Similis *U. paradiseæ*, sed crassitie majore et pileo albicanti-fusco distinguenda.

It is often a very difficult question for the naturalist to decide whether a representative form is sufficiently different to rank as a distinct species. Mere divergence in size, when other characters are identical, is, I think, hardly enough to entitle such a form to specific rank; but when variation in structure or colour supervenes, it seems better to employ a different specific term. Such is the case in the present instance. The Paradise-Jacamar of the Upper Amazons is not only much larger than the ordinary form of Cayenne and Lower Amazonia, but has a well-marked fuscous crown, which passes into whitish brown on the front and above the eyes. I have therefore called it "*Urogalba amazonum*." The American naturalists who have lately adopted a trinomial system of nomenclature would, no doubt, call it "*Urogalba paradisea*, subsp. *amazonum*." There are some advantages in their plan, which certainly has the merit of being more exact, and will probably ultimately come into general use. But for the present, I think, we have quite enough to do to reduce the well-marked species of birds into systematic order, leaving it to a future generation to work out the subspecies and minor varieties.

When I first described this species in 1855 in my 'Remarks on the Arrangement of the Jacamars,' I believe I made a great error as regards its locality. I stated, mainly on the faith of a specimen purchased of a dealer in Hamburg, that it was from Pará and Lower Amazonia. Thereupon Herr v. Pelzeln, in one of his early papers on the birds of Natterer*, pointed out that the examples of the Paradise-Jacamar obtained by that famous collector on the Madeira and Rio Negro agreed fully with Guianan specimens, and suggested that *Urogalba amazonum* must be reunited to *U. paradisea*. With this view, which was also adopted by Messrs. Cabanis and

* Sitz. Ak. Wiss. Wien, xx. p. 304 (1856).

Heine, in their elaborate review of the Jacamars in the 'Museum Heineanum'*, I was for some time disposed to concur. But when Mr. Salvin and I came to examine into the question again in working up Mr. Wallace's collection from the Lower Amazons and Rio Negro (P. Z. S. 1867, p. 581) we arrived at the conclusion that it was necessary to resuscitate the species. We remarked that this form was certainly distinguishable "by its much larger size, by the hoary terminations of the head-feathers, by the less amount of black on the chin, and by the greater extent of white on the throat below." To this opinion we likewise adhered in our 'Nomenclator,' although we were still then under the impression that this species was from Lower Amazonia. This, however, I now believe to be an error. In the collection of Salvin and Godman there is a skin of this Jacamar from Ega, on the Upper Amazons, procured by Mr. Bates; and I have little doubt that Upper Amazonia is the true patria of *Urogalba amazonum*. The replacement of Guianan species by larger and finer forms in Upper Amazonia is by no means an unusual phenomenon; and this appears to be an additional instance of its occurrence.

Having already pointed out the chief differences which distinguish this species from the nearly allied *U. paradisea*, I think it unnecessary to describe it at full length. I should, however, mention that in Mr. Bates's specimen (No. 1) the iris is marked "dark brown."

The following are the dimensions of the specimens before me:—

No.	Mus.	Patria.	Long tota,	alæ,	caudæ,	rostri a rictu.
1.	P. L. S.	Upp. Amaz.	13·0	3·8	6·3	2·7
2.	S.-G.	Ega.	11·0	3·4	5·7	2·2

The second bird is probably a female. The example figured (No. 1) is the type upon which the species was originally based.

* Mus. Hein. pars iv. sect. i. p. 217.



W. Sclater del.

Hanhart imp.

GALBULA VIRIDIS, ♂ et ♀.

GALBULA VIRIDIS.

THE GREEN-TAILED JACAMAR.

PLATE II.

- Galbula*, Briss. Orn. iv. p. 86 (1760).
The Jacamaciri of Marcgrave, Edwards, Nat. Hist. B. p. 261, pl. 334 (1764).
Alcedo galbula, Linn. Syst. Nat. i. p. 182 (1766).
Le Jacamar proprement dit, Buff. Hist. Nat. viii. p. 91, et Pl. Enl. 238 (1783).
Alcedo galbula, Gm. Syst. Nat. i. p. 459 (1789).
Galbula viridis, Lath. Ind. Orn. i. p. 244 (1790).
Le Jacamar, Aud. et Vieill. Ois. Dor. i. Jac. t. i. ♂, et
Le Jacamar à gorge rousse, ibid. t. ii. ♀ (1802).
Le Jacamar, Levaill. Ois. de Par. ii. p. 111, tt. 47, 48 (1806).
Galbula rubricollis, Steph. Gen. Zool. ix. p. 224 (1815).
Green Jacamar, Lath. Gen. Hist. iv. p. 2 (1822).
Galbula viridis, Vieill. Enc. Méth. p. 1326 (1823).
Galbula viridicauda, Sw. An. in. Men. p. 327 (1838).
Galbula viridis, Gray et Mitch. Gen. B. i. p. 83 (1847).
Galbula viridicauda, Cab. in Schomb. Guian. iii. p. 717 (1848).
Galbula viridis, Gray, List of Fiss. B. M. p. 66 (1848).
Galbula viridis, Bp. Consp. i. p. 152 (1850).
Galbula viridis, Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 308, et
Galbula viridicauda, ibid. (1851).
Galbula viridis, Reich. Handb. d. sp. Orn. p. 85 (1852).
Galbula viridis, Scl. Contr. Orn. 1852, p. 29, et Syn. Galb. p. 2 (1852).
Galbula viridis, Cassin, Cat. Hale. p. 17 (1852).
Galbula viridis, Bp. Consp. Vol. Zyg. p. 13, et
“*Galbula quadricolor*, Verr.,” ibid. (1854).
Galbula viridis, Scl. P. Z. S. 1855, p. 13.
Galbula viridis, Pelz. Sitz. Ak. Wien, xx. p. 516 (1856).
Galbula viridis, Scl. Cat. A. B. p. 265 (1862).
Galbula viridis, Cab. et Hein. Mus. Hein. iv. p. 219 (1863).
Galbula viridis, Scl. et Salv. P. Z. S. 1867, p. 581.
Galbula viridis, Pelz. Orn. Bras. p. 24 (1871).
Galbula viridis, Scl. et Salv. Nomencl. p. 104 (1873).

Suprà cupreo-viridis, in pileo magis cærulescens; alis nigris, tectricibus et secundariis extùs dorso concoloribus;
guttur albo; torque pectorali lætè viridi, ventre et subalaribus castaneis; caudâ suprà cærulescenti-

viridi, infra nigricante; rostro nigro; pedibus rubris, unguibus nigris: long. tota 7·8, alæ 3·0, caudæ 3·0, rostri a rictu 1·9. *Fem.* mari similis, sed gutture rufo et ventre dilutiore diversa.

Hab. in Guianâ, Cayennâ, Surinamo, Amazoniâ inferiore et Venezuelâ.

IN 1760 Brisson, the only pre-Linnean author who, according to the Stricklandian code, is entitled to have his generic names, when additional to those of Linnæus, recognized in the binomial system, instituted the genus "*Galbula*" for the reception of the present bird and the Paradise-Jacamar, which he termed *Galbula longicauda*. Brisson adopted the name *Galbula* from Moehring, who, in his 'Avium Genera,' published in 1752, first applied this classical term to the Jacamars, its legitimate proprietor being, as is usually believed, the Golden Oriole*.

The great Linnæus was a little behind his contemporaries as regards his knowledge of the Jacamars, and annexed these birds to the genus *Alcedo*, from which, however, Buffon and Latham again clearly distinguished them. Since their days the Jacamars have been universally allowed their proper position as an independent group; and the present Jacamar has usually been regarded as the type species of the typical genus *Galbula*.

Linnæus having called this bird *Alcedo galbula*, we must look to Latham for its first proper specific title, "*viridis*," which was bestowed upon it by that author in 1790, and has been generally used ever since. *Galbula viridis* has received but few synonyms. In 1815 Stephens very needlessly gave the name *rubricollis* to the female of this species, as figured by Audebert and Vieillot in their 'Oiseaux Dorés.' In 1838 Swainson, who was never very particular in regarding the names of previous authors, described specimens of this Jacamar obtained by Schomburgk in Guiana as *Galbula viridicauda*. Lastly, in 1854, Prince Bonaparte published, without any descriptive character, "*G. quadricolor*, Verreaux,"—a name under which, I believe, Amazonian examples of this species had been designated by the late Jules Verreaux in his MSS. and labels.

The range of this Jacamar seems to be rather wide, extending from Venezuela on the one side down to the northern bank of the Lower Amazons on the other. In Cayenne it is said by the older authors to be known as the "*Colibri des grands bois*." In Guiana Schomburgk found it "common in pairs in the woods and on the river-banks." "Here," he continues, "they sit stolidly on a twig, and patiently watching for the passing insects, after capturing which they return to their former position. One seldom hears any cry from them. The Warraus call them '*Torong*.'" In the "Museum Heineanum" Herren Cabanis and Heine have recorded the receipt of an example of this Jacamar from Puerto Cabello; and I do not doubt that it occurs all over the lower delta of the Orinoco. At the same time I should mention that I have never had an opportunity of examining Venezuelan specimens, and that the species was not, I believe, met with by Mr. Goering during his researches in the northern part of that Republic.

In Lower Amazonia *G. viridis* is widely diffused. Natterer obtained examples of it at various points on the Rio Negro and Rio Branco in 1831 and the following years, and also met with it at Borba on the Rio Madeira. Natterer notes the bill as black, the naked ring round the eye blackish grey, the iris dark brown, and the feet yellowish brown with the toes passing

* Martial writes:—

"*Galbula decipitur calamis et retibus ales,
Turget adhuc viridi cum rudis uva mero.*"

into dark brown. In the female he describes the feet as olive-green with black claws; but I can see no difference between the colours of the feet of the two sexes in dried skins. Wallace found this species in 1850 on the north bank of the Lower Amazons, and *G. rufo-viridis* taking its place on the south bank.

In the dried skin the male of *G. viridis* is of a bright shining green above with coppery reflections, rather more bluish on the head; the wing-feathers are black within, but outwardly edged with the same colour as the back; below, the chin is blackish, a large triangular patch covering the throat is white; next follows a broad breast-band of the same colour as the back; the belly, flanks, and under wing-coverts are of a deep chestnut-red; the under surface of the tail is of a deep greenish black; the upper surface is of the same colour as the back. The female differs only in having the throat of a pale rufous and the belly of not quite so dark a chestnut.

The tail in *G. viridis* is not so long as in the three succeeding species, the rectrices being much more nearly equal in length. As in all the *Galbulæ*, the outer pair are quite diminutive, being only about 0·8 in length from their insertion; the second pair measure about 2·5 inches; and the others, half an inch longer, form the slightly rounded extremity.

In Amazonian specimens (*G. quadricolor*) the white throat-patch is more contracted, and the green pectoral band rather wider.

The following are the dimensions of the skins of this species in my collection:—

No.	Sex.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♂	Cayenne.	7·8	3·1	3·4	1·8
2.	♀	Cayenne.	7·2	3·2	3·2	1·8
3.	♂	Lower Amazons (<i>Wallace</i>).	7·8	3·0	3·0	1·9

The examples figured in Plate II. are Nos. 3 (fig. 1) and 2 (fig. 2).



TACHYNETA THALASSINA

Handl. 1842

GALBULA RUFO-VIRIDIS.

THE RED-AND-GREEN-TAILED JACAMAR.

PLATE III.

- Galbula viridis*, Max. Beitr. iv. p. 436 (1832).
Galbula ruficauda, Sw. An. in Men. p. 327 (1838).
Galbula ruficauda, Gray et Mitch. Gen. B. i. p. 83 (1847).
Galbula ruficauda, Gray, List of Fiss. B. M. p. 66 (1848).
Galbula rufo-viridis, Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 308 (1851).
Galbula maculicauda, Scl. Contr. Orn. 1852, p. 29, et Syn. Galb. p. 2 (1852).
Galbula ruficauda, Reich. Handb. d. sp. Orn. p. 86 (1852).
Galbula maculicauda, Cassin, Cat. Halc. p. 17 (1852).
Galbula maculicauda, Bp. Consp. Vol. Zyg. p. 13 (1854).
Galbula rufo-viridis, Scl. P. Z. S. 1855, p. 13.
Galbula viridis, Burm. Syst. Ueb. ii. p. 299, et
Galbula ruficauda, ibid. p. 300 (1856).
Galbula maculicauda, Pelz. Sitz. Ak. Wien, xx. p. 516 (1856).
Galbula rufo-viridis, Scl. Cat. A. B. p. 266 (1862).
Galbula rufo-viridis, Cab. et Hein. Mus. Hein. iv. p. 220 (1863).
Galbula rufo-viridis, Scl. et Salv. P. Z. S. 1867, p. 581.
Galbula rufo-viridis, Reinh. Fuglef. Bras. Camp. p. 122 (1870).
Galbula maculicauda, Pelz. Orn. Bras. p. 24 (1871).
Galbula rufo-viridis, Scl. et Salv. Nomencl. p. 104 (1873).
Galbula rufo-viridis, Scl. et Salv. P. Z. S. 1879, p. 633.

Suprà cupreo-viridis; alis nigris, tectricibus et secundariis extùs dorso concoloribus; subtùs gutture albo, torque pectorali lætè viridi, ventre et subalaribus castaneis; caudæ rectricibus mediis viridibus, lateralibus castaneis, secundo et tertio pari fuscescente viridi terminatis; rostro nigro; pedibus rubris, unguibus nigris: long. tota 9·0, alæ 3·2, caudæ 3·8, rostri a rictu 2·1. *Fem.* mari similis, sed gutture rufescente et ventre dilutiùs castaneo.

Hab. in Brasiliâ meridionali et Boliviâ occidentali.

MAXIMILIAN, PRINZ ZU WIED, was certainly one of the best observers that have ever written on Neotropical ornithology; and his volumes on the Natural History of Brazil will always remain a proof of what excellent work may be accomplished with care and energy by a non-professional naturalist. But the Prince was not so well acquainted with the objects described by former authors as with those which he had himself met with, and in consequence has often made mistakes in the determination of his species. Such was the case as regards the present Jacamar, which he referred to the *Galbula viridis* of Latham, although it belongs to quite a different species. A somewhat similar error was committed by Swainson, who in 1838 described this bird

as *Galbula ruficauda*, that name having been previously appropriated by Cuvier to another species. About 1850 Dr. Cabanis at Berlin, and I at Oxford, were both at work on a revision of the species of Jacamars, and came alike to the conclusion that the Brazilian bird had been wrongly determined and required a new name. Dr. Cabanis, in his article on the Jacamars published in Ersch and Gruber's 'Encyclopädie der Wissenschaft und Kunst' in 1851, proposed that this name should be "*rufo-viridis*," whilst I, in my revision of the same group issued in Jardine's 'Contributions to Ornithology' in the succeeding year, suggested for it the term "*maculicauda*." Dr. Cabanis's name having precedence, has been now generally adopted as the proper designation of this Jacamar.

Galbula rufo-viridis, as it must therefore be called, is the sole representative of its genus in South-eastern Brazil, but is distributed over a much larger area than the wood-region of Brazil commonly understood by that term, extending nearly up to the Amazons on the north and into Eastern Bolivia in the interior. As I have already stated, its original discoverer was Prince Maximilian of Neuwied, who found it common in the forests of South-eastern Brazil, along the banks of the clear dark-brown rivulets, sitting on the branches over the water and engaged in capturing insects. Prince Maximilian comments on its resemblance in some respects to the Humming-birds, and informs us that the Botocudo savages call it "*Merokniung-gipakiu*," or the Great Humming-bird, and the Portuguese "*Beja-flor*." Its food he considers to be entirely insects, the remains of which he found in the stomachs of the specimens which he dissected. Burmeister, who wrote of the animals of the same district at a later period, does not seem to have been so well acquainted with this Jacamar as Prince Maximilian; for he describes it, apparently, under two different names. He gives us, however, the useful information that its stomach is exactly like that of *Monasa*, and contains insects. "The cæca are shorter, but much clubbed; the tongue is about half the length of the bill, small, pointed, smooth, and divided posteriorly into two indented flaps."

The distinguished naturalist Natterer collected a series of twenty-five examples of this Jacamar at various localities during his journey through the interior of Brazil. Herr v. Pelzeln, in his excellent 'Ornithologie Brasiliens,' has given us an exact list of these localities, which it is not necessary to repeat at full length. It is sufficient to say that Natterer met with this species at various spots in the provinces of Rio, Sao Paulo, Goyaz, and Matto Grosso, and along the Bolivian frontier as far north as Salto Theotonio on the Madeira. That it extends beyond that frontier into the eastern parts of the adjacent Republic we know from its having been procured in the Bolivian province of Chiquitos by d'Orbigny, whose specimens of this species in the Paris Museum are marked "*Galbula macroura*." I have likewise two skins of this species which, although purchased of a dealer, are, I have no doubt, of Bolivian origin.

At the northern extremity of its range *Galbula rufo-viridis* approaches the Amazons, if it does not really occur on the banks of that mighty river. Mr. Wallace met with this species on the Rio Tocantins south of Pará; and Mr. Bates, writing of his journey up the same river, tells us (Naturalist on the Amazons, vol. i. p. 138) "one species of Jacamar was not uncommon here (*Galbula viridis*); I sometimes saw two or three together seated on a slender branch, silent and motionless with the exception of a slight movement of the head. When an insect flew past within a short distance, one of the birds would dart off, seize it, and return again to its sitting-

place." Mr. Bates's so-called "*Galbula viridis*" is, no doubt, the present species, which, as just mentioned, was actually obtained by Mr. Wallace in the same district*.

The adult male of *G. rufo-viridis* is above of the usual shining green with coppery reflections; the wing-feathers are black in the interior, the secondaries and wing-coverts being edged externally with green like the back; below, the throat is white, divided by a pectoral band of the same colour as the back from the deep-chestnut abdomen; the under wing-coverts and inner margins of the secondaries are of the same colour as the abdomen, the inner margins of the primaries are of a pale rufous. The two middle rectrices are above of a shining green like the back, below greenish black; the next pair are similarly coloured, but the basal halves of the inner webs and the stems of the feathers are chestnut; the third pair are wholly chestnut; the fourth and fifth pairs are also chestnut, but have a greenish blotch at the ends, which is bright green above and dull below, like the middle tail-feathers; the diminutive external pair, which only measure 1.2 inch from their insertion, are also chestnut with a slight greenish spot at the end. The female scarcely differs except in having the throat pale rufous and the belly perhaps rather paler in tinge.

Natterer's notes, as published by v. Pelzeln, inform us that this Jacamar is called "*Chupa-flor do matto virgem*," or "Humming-bird of the virgin forest," at Sapitiba, in the province of Rio. Natterer records the bill as "black; tongue long, thin, flattened like fine paper, and white in colour; iris dark brown; feet yellow greenish brown, dark brown towards the tips of the toes; claws black." In the female the feet are described as "olive-yellow," and the tips of the toes "blackish;" "claws black." Natterer adds that the bird resembles the Bee-eater (*Merops apiaster*) in habits: "it flies from a branch into the air when an insect passes, and having caught it lights on another branch to kill it. It makes holes in the banks to nest in."

The following measurements are taken from the specimens of this species in my collection and in that of Messrs. Salvin and Godman:—

No.	Sex.	Patria.	Mus.	Long. tota,	alæ,	caudæ,	rostri a rictu.
1.	♂	Brazil.	P. L. S.	9.0	3.2	3.8	2.1
2.	♂	Bolivia.	P. L. S.	9.5	3.3	3.7	2.3
3.	♀	Bolivia.	P. L. S.	9.4	3.2	3.6	2.2
4.	♂	Bahia (<i>Wucherer</i>).	S.-G.	8.2	3.2	3.9	2.1
5.	♀	Bahia (<i>Wuch.</i>).	S.-G.	8.2	3.1	3.6	2.1
6.	♀	Bahia (<i>Wuch.</i>).	S.-G.	8.2	3.1	3.7	2.1
7.	♂	Novo Fribourgo (<i>J. Youds</i>).	S.-G.	8.8	3.2	3.9	2.2
8.	♀	Novo Fribourgo (<i>J. Youds</i>).	S.-G.	8.6	3.2	3.9	2.1

The figure of the male in Plate III. is taken from No. 1, which is also the type of *G. maculicauda*, mihi; that of the female from No. 3.

* See "List of Birds collected by Mr. Wallace on the Amazons and Rio Negro. By P. L. Selater and Osbert Salvin," P. Z. S. 1867, p. 566.



W. K. de Meillon del.

Hanhart imp.

GALBULA RUFICAUDA, ♂ et ♀.

GALBULA RUFICAUDA.

THE RUFOUS-TAILED JACAMAR.

PLATE IV.

- Galbula viridis*, var. β , Lath. Ind. Orn. i. p. 245, partim (1790)?
Le Jacamar à queue rousse, Levaill. Ois. de Par. ii. p. 115, t. 50 (1806).
Galbula ruficauda, Cuv. Règn. An. i. p. 420 (1817).
Galbula macroura, Vieill. Enc. Méth. p. 1326 (1823).
Rufous-tailed Jacamar, Lath. Gen. Hist. iv. p. 4 (1823).
Galbula macroura, Vieill. Gal. Ois. i. pt. 2, p. 12, t. 29 (1825).
Galbula leptura, Sw. An. in Men. p. 327 (1838).
Galbula leptura, Jard. Ann. N. H. xix. p. 80 (1847).
Galbula leptura, Gray et Mitch. Gen. B. i. p. 83 (1847).
Galbula leptura, Cab. in Schomb. Guian. iii. p. 717 (1848).
Galbula leptura, Gray, List of Fiss. B. M. p. 66, et
Galbula macroura, ibid. (1848).
Galbula leptura, Bp. Consp. i. p. 152 (1850).
Galbula ruficauda, Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 308 (1851).
Galbula ruficauda, Scl. Contr. Orn. 1852, p. 30, et Syn. Galb. p. 3 (1852).
Galbula macroura, Reich. Handb. d. sp. Orn. p. 86 (1852).
Galbula ruficauda, Cassin, Cat. Halc. p. 17 (1852).
Galbula ruficauda, Bp. Consp. Vol. Zyg. p. 13 (1854).
Galbula ruficauda, Scl. P. Z. S. 1855, pp. 13 et 136.
Galbula macrura, Burm. Syst. Ueb. ii. p. 300 (1856).
Galbula ruficauda, Pelz. Sitz. Ak. Wien, xx. p. 516 (1856).
Galbula ruficauda, Scl. Cat. A. B. p. 266 (1862).
Galbula ruficauda, Cab. et Hein. Mus. Hein. iv. p. 222 (1863).
Galbula ruficauda, Léotaud, Ois. Trinidad, p. 116 (1866).
Galbula ruficauda, Scl. et Salv. P. Z. S. 1868, p. 168.
Galbula ruficauda, Pelz. Orn. Bras. p. 24 (1871).
Galbula ruficauda, Scl. et Salv. Nomencl. p. 104 (1873).
Galbula ruficauda, Scl. et Salv. P. Z. S. 1879, p. 535.

Aureo-viridis; alis nigris, tectricibus et secundariis extùs dorso concoloribus; gutture et mento albis; ventre et subalaribus castaneis; caudæ rectricibus duabus mediis viridibus, ceteris omninò castaneis; rostro nigro; pedibus rubris, unguibus nigris: long. tota 10·0, alæ 3·3, caudæ 4·6, rostri a rictu 2·8. *Fem.* mari similis, sed gutture rufo et ventre paulo dilutiore distinguenda.

Hab. in Guianâ, Venezuelâ, ins. Trinitatis ins. Tobago et Colombiâ.

THERE can be little doubt that Latham had seen examples of this Jacamar, as in describing his "*Galbula cauda longiore*," he wrote "in quibusdam rectrices duæ intermediæ viridi-aureæ, reliquæ rufæ;" but he did not rightly distinguish it from *G. viridis*. Levaillant, however, a few years later gave a sufficiently good figure of the present species in the second volume of his 'Oiseaux de Paradis,' and clearly understood its specific validity. Upon Levaillant's figure Cuvier in 1817 based his *Galbula ruficauda*, which is the proper systematic name for this bird, taking precedence of Vieillot's *Galbula macroura* (the appellation next given) by several years.

In 1838 Swainson introduced considerable confusion into this group by redescribing the present bird under a third name "*leptura*," and calling another species (*G. rufo-viridis*) *Galbula ruficauda*. This error was corrected by Dr. Cabanis and myself about the same period, as has been pointed out in the preceding article; and "*ruficauda*" is now the term under which the present Jacamar is generally known to naturalists.

Galbula ruficauda has a considerable range in the northern part of South America, occurring throughout Venezuela, and extending into the adjacent districts of Colombia on the one hand, and British Guiana on the other, while it is likewise met with in the islands of Trinidad and Tobago. In British Guiana, Schomburgk tells us that its habits are exactly the same as those of *G. viridis*, although it resorts more to the denser and more shady forests. He found it most common in the neighbourhood of Golden Hill. The Macusi Indians call it "*Kujei*," the Arekunas "*Picima*." Natterer obtained examples of this Jacamar near Fort S. Joaquim, on the Rio Branco, in the forests on the right bank of that river, in the winter of 1831-32. He notes the naked skin round the eye as dark bluish grey, and the iris as dark brown. In Venezuela this Jacamar is probably of general occurrence, though we have at present very imperfect information about the ornithology of the greater portion of this country. But it is certainly met with in the collections commonly received from Caraccas, and from the delta of the Orinoco (*viâ* Trinidad); and specimens of it were obtained by Goering at Carupano, in the province of Cumaná. Léotaud, in his 'Birds of Trinidad,' tells us that this Jacamar is very common in that island, frequenting shady and wet places, and resting hours long perched on a branch without moving, except to seize a passing insect. Léotaud adds that it feeds principally on earth-worms, which it seeks on the ground; but I am rather inclined to doubt this part of his story, as it is quite contrary to the usual habits of the group.

Mr. Kirk, our authority on the birds of Tobago, gives us the following notes on *G. ruficauda* as observed by him:—"Jackamar of natives: eyes dull red; feeds on cantharides flies; builds in marl banks like the Mot-Mot, without any preparation, except digging a hole or entrance an inch and a half in diameter; the distance of the eggs from the entrance about 18 inches; they are three in number, pure white, and nearly circular, differing only one tenth in longitudinal diameter."

Examples of the Tobagan bird prepared by Mr. Kirk are in my own collection, and fully agree with continental skins.

In the United States of Colombia this Jacamar appears to extend along the wood-region of the coast-range as far as Santa Marta, examples of it having been recently obtained at Valle Dupar, near the base of the Sierra Nevada of Santa Marta, by Mr. Simons, who is now exploring that district for Messrs. Salvin and Godman. In the interior of Colombia this Jacamar is met

with in the province of Antioquia, where examples were obtained by Mr. Salmon, and also occurs occasionally in "Bogotá" collections. In the latter district it does not appear to be very common; but a female specimen of the regular "Bogotá" manufacture is in my own collection, and I have seen others similar.

The upper plumage of *G. ruficauda* is of the usual brilliant coppery green of this group; the wing-feathers are blackish, the secondaries and coverts being edged with green like the back; below, the whole throat is pure white, separated from the chestnut abdomen by a green breast-band; the under wing-coverts and inner margins of the wings are rufous, paler on the primaries; the two middle tail-feathers are above bright green like the back, below greenish black, the others are entirely chestnut-red; the bill is black; the feet red, with black claws. In the female the throat is of a pale rufous.

The following are the dimensions of the examples of this Jacamar in my own collection and that of Messrs. Salvin and Godman:—

No.	Sex.	Patria.	Mus.	Long. tota,	alæ,	caudæ,	rostri.
1.	♂	Antioquia (<i>Salmon</i>).	S.-G.	8·8	3·2	4·2	2·0
2.	♀	Antioquia (<i>Salmon</i>).	S.-G.	8·7	3·2	3·9	1·8
3.	♀	Bogotá.	P. L. S.	8·2	3·1	3·9	1·8
4.	♂	Bogotá.	S.-G.	9·2	3·2	4·2	1·9
5.	♀	Valle Dupar, S. Marta (<i>Simons</i>).	S.-G.	10·0	3·2	4·6	2·0
6.	♂	Carupano, Venezuela (<i>Goering</i>).	S.-G.	9·5	3·3	4·5	2·1
7.	♀	Venezuela (<i>Goering</i>).	S.-G.	9·4	3·0	3·9	2·1
8.	♂	Trinidad.	P. L. S.	10·0	3·2	4·6	1·8
9.	♀	Trinidad.	P. L. S.	10·0	3·1	4·4	2·4
10.	♂	Tobago (<i>Kirk</i>).	P. L. S.	9·0	3·2	4·5	2·1
11.	♀	Tobago (<i>Kirk</i>).	P. L. S.	9·1	3·2	4·3	2·1
12.	♂	Guiana (<i>Brown</i>).	P. L. S.	9·5	3·2	4·5	2·4

The specimens figured on Plate IV. are Nos. 8 and 9 of this list.



Galbula melanogenia

Hanhart imp

GALBULA MELANOGENIA, ♂ et ♀.

GALBULA MELANOGENIA.

THE BLACK-CHINNED JACAMAR.

PLATE V.

- Galbula melanogenia*, Scl. Contr. Orn. p. 61, t. 90 (1852).
Galbula melanogenia, Scl. Syn. Galb. p. 3 (1852).
Galbula melanogenia, Scl. P. Z. S. 1855, p. 13.
Galbula melanogenia, Scl. P. Z. S. 1856, p. 139.
Galbula melanogenia, Scl. P. Z. S. 1858, p. 357.
Galbula melanogenia, Scl. et Salv. Ibis, 1859, p. 131.
Galbula melanogenia, Scl. P. Z. S. 1859, p. 53.
Galbula melanogenia, Scl. et Salv. Ibis, 1860, p. 40.
Galbula melanogenia, Taylor, Ibis, 1860, p. 116.
Galbula melanogenia, Scl. Cat. A. B. p. 266 (1862).
Galbula melanogenia, Cab. et Hein. Mus. Hein. iv. p. 221 (1863).
Galbula melanogenia, Salvin, P. Z. S. 1867, p. 151.
Galbula melanogenia, v. Frantzius, Journ. f. Orn. 1869, p. 311.
Galbula melanogenia, Salvin, P. Z. S. 1870, p. 201.
Galbula melanogenia, Scl. et Salv. P. Z. S. 1870, p. 837.
Galbula melanogenia, Salvin, Ibis, 1872, p. 321.
Galbula melanogenia, Scl. et Salv. Nomencl. p. 104 (1873).

Aureo-viridis; alis nigris, tectricibus et secundariis extùs dorso concoloribus; gutture albo, mento nigro; ventre et subalaribus castaneis; caudæ rectricibus quatuor mediis viridibus, ceteris omninò castaneis; rostro nigro; pedibus rubris, unguibus nigris: long. tota 9·0, alæ 3·3, caudæ 4·0, rostri a rictu 2·3.
Fem. mari similis, sed gulâ rufescente et ventre paulò dilutiore.

Hab. in Mexico meridionali et Americâ centrali ferè universâ.

Obs. *G. ruficaudæ* admodum similis, sed mento nigro et rectricibus quatuor mediis viridibus prorsùs distinguenda.

THIS Jacamar was first discriminated by me from *G. ruficauda* in 1852, when I was preparing a synopsis of the Galbulidæ for publication in Jardine's 'Contributions to Ornithology,' and was described in that journal. The pair of skins upon which I founded the species are still in my collection. They were purchased in Leadbeater's shop, but are undoubtedly the manufacture of the French collector Delattre, whose excellent handwork is easily recognized by those experienced in the "make" of birdskins. They were probably obtained in Vera Paz, where Delattre was one of the earliest explorers. Happily the term *melanogenia*, by which I proposed to distinguish it, from its characteristic black chin, has been universally adopted as the name of this species, and has no synonyms.

My good friend and fellow-worker Osbert Salvin, our best authority on Central-American birds, has kindly favoured me with the subjoined notes on this species:—

“*Galbula melanogenia*, so far as is at present known of its range, is exclusively found in the forests of the eastern parts of Mexico, Guatemala, and Honduras. Its presence in the first-named country has only once been noted by Boucard, who obtained a single specimen of it in April at Playa Vicente (see P. Z. S. 1859, p. 387).

“In Guatemala it is by no means an uncommon bird in Northern Vera Paz, near the Indian village of Choctum, and in the forests which stretch away to the confines of Peten. It is from this district that the bird-hunters of Coban obtain the specimens that come to Europe in Guatemalan collections of bird-skins. This tract of country lies at an elevation of about 1000 to 1500 feet, and is heavily timbered with virgin forest. Mr. Godman and I were some time in this district in the early months of 1862; but *Galbula melanogenia* never actually came under our personal observation, though our Indian hunters not unfrequently brought us freshly shot specimens. When making my way to the city of Guatemala in June 1859 I once saw this *Galbula* in the outskirts of the village of Yzabal. It flew a short way along the road and settled in the brushwood at the side, above one of the beautiful banks of the creeping fern (*Gleichenia*) which there abounds. It remained, like a Kingfisher, almost motionless on its perch as I passed near it on my way. I afterwards saw another near the village of Teleman, on the Polochic river, which flows into the Lake of Yzabal. This was in the forest between Teleman and Panzos, the embarking-place for canoes descending the river. This bird also started from its resting-place near when I passed along the forest track, flew a short distance, and settled again. Its flight is quick, but rather spasmodic, not unlike that of a Motmot or Trogon.

“Southwards of Guatemala we find *Galbula melanogenia* still restricted to the forests of the Atlantic side of the country. Leyland met with it near Omoa, in the republic of Honduras, and G. M. Whitely near San Pedro, in the same country. In Nicaragua, too, it is also found in the eastern forests, Mr. Belt having met with it near Chontales (see Ibis, 1872, p. 321).

“In Costa Rica the numerous collectors who have worked there found it at several points (Pacuar, San Carlos, and Turrialba); but here it is met with for the first time on the shores of the Pacific; for Arcé sent us specimens procured at Bebedero, a village near the head of the Gulf of Nicoya. In the neighbourhood of Chiriqui, on the shores of the same ocean, *G. melanogenia* has been found by several collectors. Bridges first obtained it near David (see P. Z. S. 1856, p. 139); and more recently skins have been not unfrequently included in collections of birds from that district. Southwards of Chiriqui, however, we have no trace whatever of *Galbula melanogenia*, as it has never been obtained in the more eastern parts of the State of Panama, nor yet on the line of railway where so many large collections have been made during the past eighteen years. The Jacamar of this part of the isthmus is *Jacamerops grandis*; and this form, as it seems, entirely supplants the more northern bird, and divides its range from that of *G. ruficauda*, which comes up certainly as far as Santa Marta and the province of Antioquia.”

The plumage of the male *G. melanogenia* above is of the usual bright metallic green prevalent in this group of birds, but with not so much coppery reflection as in the previous species; the wing-feathers are black, the secondaries and wing-coverts being edged with green like the back; the sides of the face and chin are black; the throat is white, succeeded by a brilliant green breast-

band; the abdomen and under wing-coverts are chestnut-red; the four middle tail-feathers are bright green like the back above, and dull greenish black below; the rest of the tail-feathers are chestnut-red, not so deep in colour as the belly. In some specimens there is a green blotch at the base of the outer web of the tail-feather next to the two green pairs on each side. The bill is black; the feet brown with black claws.

The female differs from the male only in having the throat pale rufous, and the chestnut abdomen perhaps slightly paler.

I add a list of the specimens of this species in my own collection and in that of Messrs. Salvin and Godman, arranged in geographical order, together with their measurements.

No.	Sex.	Mus.	Patria.	Long tota,	alæ,	caudæ,	rostri.
1.	♂	P. L. S.	Vera Paz (<i>Delattre</i>).	9.0	3.3	4.0	2.3
2.	♀	P. L. S.	Vera Paz (<i>Delattre</i>).	8.8	3.3	4.0	2.3
3.	♂	S.-G.	Teleman, Vera Paz (<i>O. S.</i>).	9.5	3.2	4.1	2.3
4.	♀	S.-G.	Teleman, Vera Paz (<i>O. S.</i>).	8.4	3.2	3.7	2.0
5.	♂	S.-G.	Sources of R. de la Pasion, Vera Paz (<i>O. S.</i>).	9.5	3.3	4.2	2.3
6.	♀	S.-G.	Choctum, Vera Paz (<i>O. S.</i>).	9.0	3.3	4.1	2.1
7.	jr.	S.-G.	Chisec, Vera Paz (<i>O. S.</i>).	7.7	3.2	3.3	1.4
8.	♂	S.-G.	San Pedro, Honduras (<i>Whitely</i>).	8.8	3.3	4.0	2.2
9.	♀	S.-G.	Costa Rica (<i>Carmiol</i>).	8.6	3.2	3.8	2.0
10.	♀	S.-G.	Costa Rica (<i>Arcé</i>).	8.8	3.2	3.9	2.1
11.	♀	S.-G.	Costa Rica (<i>Arcé</i>).	8.8	3.2	4.0	2.2
12.	♂	S.-G.	Chontales, Nicaragua (<i>Belt</i>).	9.4	3.2	4.2	2.1
13.	♂	P. L. S.	Veragua (<i>Arcé</i>).	8.2	3.2	4.2	1.9
14.	♀	P. L. S.	Veragua (<i>Arcé</i>).	8.2	3.1	3.9	1.7
15.	♂	S.-G.	Bugaba, Chiriqui (<i>Arcé</i>).	9.0	3.1	4.3	2.2
16.	♂	S.-G.	Bugaba, Chiriqui (<i>Arcé</i>).	8.5	3.1	4.1	2.1
17.	♀	S.-G.	Bugaba, Chiriqui (<i>Arcé</i>).	8.6	3.1	3.8	2.0

The specimens figured (Plate V.) are Nos. 1 and 2, upon which the species was originally established.



W. Verelstede del.

Hanhart imp.

GALBULA TOMBACEA, ♂ et ♀

GALBULA TOMBACEA.

THE BRONZY JACAMAR.

PLATE VI.

- Galbula tombacea*, Spix, Av. Bras. i. p. 55, t. 58 (1824).
Galbula tombacea, Gray et Mitch. Gen. B. i. p. 83 (1847).
Galbula cyanescens, Deville, Rev. Zool. 1849, p. 56.
Galbula tombacea, Bp. Consp. i. p. 152 (1850).
Galbula tombacea, Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 308 (1851).
Galbula tombacea, Cassin, Cat. Halc. p. 17, et
Galbula cyanescens, Cassin, loc. cit. (1852).
Galbula tombacea, Scl. Contr. Orn. 1852, p. 30, et Syn. Galb. p. 4.
Galbula tombacea, Reich. Handb. d. sp. Orn. p. 87, et
Galbula cyanescens, Reich. loc. cit. (1852).
Galbula tombacea, Bp. Consp. Vol. Zyg. p. 13 (1854).
Galbula tombacea, Tsch. Faun. Per. Aves, p. 255 (1855).
Galbula tombacea, Scl. P. Z. S. 1855, p. 13, et
Galbula fuscicapilla, Scl. loc. cit. pl. lxxvii. (1855).
Galbula fuscicapilla, Scl. P. Z. S. 1855, pp. 13 et 136.
Galbula tombacea, Burm. Syst. Ueb. iii. p. 301 (1856).
Galbula tombacea, Scl. P. Z. S. 1857, p. 262.
Galbula tombacea, Scl. Cat. A. B. p. 266 (1862).
Galbula fuscicapilla, Cab. et Hein. Mus. Hein. iv. p. 223, et
Galbula tombacea, Cab. et Hein. loc. cit., et
Galbula cyanescens, Cab. et Hein. loc. cit. (1863).
Galbula tombacea, Scl. et Salv. P. Z. S. 1866, p. 192.
Galbula tombacea, Scl. et Salv. P. Z. S. 1867, p. 978.
Galbula tombacea, Scl. et Salv. P. Z. S. 1873, p. 186.
Galbula tombacea, Scl. et Salv. P. Z. S. 1873, p. 294.
Galbula tombacea, Scl. et Salv. Nomencl. p. 105 (1873).

Splendidè cupreo-viridis; alis intùs nigris, secundariis et tectricibus extùs dorso concoloribus; pileo antico in quibusdam exemplis fusco, in aliis dorso concolori; subtùs usque ad medium ventrem viridis, sicut suprà; mento plus minùsve grisescenti-albido; ventre imo' et rectricibus lateralibus cum subalaribus et hypochondriis saturatè castaneis; rectricum pari quarto et quinto maculâ viridi in pogonio externo terminatis; rectricibus quatuor mediis suprà dorso concoloribus, subtùs obscurioribus; remigum marginibus internis angustis albis; rostro nigro; pedibus fuscis: long. tota 8·5, alæ 3·0, caudæ 3·5, rostri 1·8. *Fem.* colore ventris et rectricum lateralium valdè dilutiore et flavescentiore diversa.

Hab. in Colombiâ interiore, Æquatoriâ orientali, et in Peruviae regione sylvaticâ orientali.

As will be seen by the accompanying Plate, there are two forms of this Jacamar, differing in the colour of the head, which in the one is green like the back, sometimes with slight bluish reflections, in the other brown with narrow green edgings to some of the feathers. Not being able to convince myself that this slight diversity indicates a real specific difference, I shall speak of these plumages as the green-headed and brown-headed forms of the present species.

The celebrated German naturalist Spix was the original discoverer of this Jacamar, during his expedition to Brazil and up the Amazons in 1817 and the following years. In his well-known work on the results of this journey, published in 1824, Spix described the present bird as *Galbula tombacea*, in allusion to its metallic colour, "tombac" in German being, I believe, nearly the equivalent of pinchbeck, or of what is technically called red metal. Whether the bird described by Spix belonged to the brown-headed or green-headed form of this species is not quite certain. From his description it would appear that the former was the case; but unless my memory deceives me, the specimen in the Museum of Munich, supposed to be the type of *G. tombacea*, which I examined some years ago, is of the green-headed form.

In 1849 this Jacamar was redescribed by the French naturalist Deville under the name "*cyanescens*," from specimens obtained by him during his descent of the Amazons in company with M. de Castelnau. Here, again, there is some doubt to which of the two forms Deville's name is properly referable. Though the description would indicate the brown-headed form, Deville certainly obtained examples of both the green-headed and brown-headed birds, as I have ascertained by the examination of his specimens in the Paris Museum.

When I read my "Remarks on the Arrangement of the Jacamars" before the Zoological Society in 1855, I had never seen examples of the brown-headed bird from the Amazons. Finding that all the "Bogotá" skins I had then met with presented this feature, I concluded that they belonged to a different species, which I proposed to call *G. fuscicapilla*. Messrs. Cabanis and Heine took the same view in their excellent memoir on the Jacamars published in the 'Museum Heineanum' in 1853. They gave accurate descriptions of the brown-headed (Bogotá) bird as *G. fuscicapilla*, and of the green-headed bird as *G. tombacea*, and retained also the name *cyanescens* for the "apparently intermediate" Amazonian form, which they had not seen. But I cannot follow this plan, because I have before me an Amazonian skin (from Pebas) which I cannot in any way distinguish from the Bogotá form, and have seen many other brown-headed birds from Amazonia. On the whole it appears to me that the only way out of the difficulty is to unite all the forms under one name, it being very doubtful whether either "*tombacea*" or "*cyanescens*" could be legitimately applied to the green-headed form as distinct from *G. fuscicapilla*. Having said thus much, I will now proceed to the general geographical distribution of this species from north to south.

G. tombacea in the brown-headed phase is frequently met with in Bogotá collections. But it is probable that these skins are from the valleys drained by the upper affluents of the Orinoco and Amazons south of Bogotá, and that this species does not occur to the north of the Andean range. On the Upper Amazons this Jacamar has been obtained subsequently to Spix's time by Hauxwell at Pebas, and by E. Bartlett at Nauta. Such of Hauxwell's skins as I have examined belong strictly to the brown-headed form, whereas those of Bartlett are green-headed and black-chinned. The specimens from Rio Javari, which, although transmitted by Mr. Bates, were not, I believe, collected by him personally, are somewhat intermediate in their characters, but perhaps

come nearest to the brown-headed phase, the fuscous head being slightly edged with bluish green, and the chin darker than in Bogotá birds. On the Ucayali Deville obtained examples of both forms; and it does not appear from the skins in the Paris Museum on which of them his *G. cyanescens* is based, although his description seems to indicate the brown-headed bird. Farris's skins of this species, collected somewhere in the interior of Northern Peru, and Whitely's examples from Cosnipata belong altogether to the green-headed form. In the latter there is no trace of fuscous colour on the head, the bright metallic green commencing immediately from the front, and the chin is but slightly blackish in the male, and fuscous in the female. On the whole we may say that the two extreme forms of this species are found, as is so often the case in nature, in the two extremities of its range, whilst examples from intermediate localities are more or less intermediate in their characters.

Taking one of Hauxwell's excellently made skins as a pattern, I should describe the general plumage of the male of *G. tombacea* as brilliant metallic green with coppery reflections in some lights. The wing-feathers are black, the secondaries and wing-coverts being edged externally with green like the back. The crown of the head is brown, with slight green margins to one or two of the feathers. The chin is greyish white. The green colour of the upper surface is continued below halfway down the belly, the lower half of which, together with the sides, under wing-coverts, and lateral tail-feathers, is of a deep chestnut-red. The four middle tail-feathers are green like the back above, and dark green below, with a small blotch on the inner web of the base of the submedian pair. The third pair are wholly chestnut. The fourth and fifth pairs are also chestnut, but have an elongated green patch along the outer web towards their extremities. The diminutive external pair seem to be wholly chestnut-red. In the female the belly is much paler and more yellowish in tinge. In both sexes the bill is black, and the legs brown (in the dried skins) with black claws.

The following is a list of the examples of this Jacamar in my own collection and that of Messrs. Salvin and Godman, arranged geographically:—

No.	Sex.	Mus.	Patria.	Long tota,	alæ,	caudæ,	rostri.
1.	♂	P. L. S.	Bogotá.	8·0	3·1	3·5	2·0
2.	♂	P. L. S.	Bogotá.	7·8	3·0	3·7	2·1
3.	♂	S.-G.	Bogotá.	8·2	3·2	3·8	2·0
4.	♀	S.-G.	Bogotá.	7·3	3·1	3·2	1·9
5.	♂	S.-G.	Pebas (<i>Hauxwell</i>).	8·5	3·0	3·5	1·8
6.	♀	S.-G.	Pebas (<i>Hauxwell</i>).	8·0	2·9	3·4	1·8
7.	♂	P. L. S.	Rio Javari (<i>Bates</i>).	7·6	3·0	3·5	1·8
8.	♂	P. L. S.	Rio Javari (<i>Bates</i>).	7·5	3·0	3·5	1·8
9.	♂	P. L. S.	Nauta (<i>Bartlett</i>).	7·7	3·2	3·4	2·0
10.	♂	P. L. S.	E. Peru (<i>Farris</i>).	9·0	3·2	3·6	2·2
11.	♂	S.-G.	E. Peru (<i>Farris</i>).	8·5	3·2	3·8	2·0
12.	♂	S.-G.	Cosnipata (<i>Whitely</i>).	8·5	3·2	3·8	2·1
13.	♀	S.-G.	Cosnipata (<i>Whitely</i>).	8·3	3·1	3·5	2·0

Of these, Nos. 1 to 6 belong strictly to the brown-headed form with whitish chin, Nos. 7 and 8 are intermediate in characters, and the others belong to the green-headed race with blackish chin. The examples figured are Nos. 7 and 13.



Hanhart imp

GALBULA ALBIROSTRIS. ♂ et ♀.

GALBULA ALBIROSTRIS.

THE WHITE-BILLED JACAMAR.

PLATE VII.

White-billed Jacamar, Lath. Syn. Suppl. p. 113 (1787).

Galbula albirostris, Lath. Ind. Orn. i. p. 245 (1790).

Le Venetou, Aud. et Vieill. Ois. Dor. i. Jac. tt. iv. v. (1802).

Le petit Jacamar ou *Jac. à bec jaune*, Levaill. Ois. de Par. ii. p. 118, t. 51 (1806).

Galbula flavirostris, Vieill. Nouv. Dict. xvi. p. 443 (1817).

White-billed Jacamar, Lath. Gen. Hist. iv. p. 6 (1822).

Galbula flavirostris, Vieill. Enc. Méth. p. 1326 (1823).

Galbula flavirostra, Swains. An. in Men. p. 328 (1838).

Galbula albirostris, Gray et Mitch. Gen. B. i. p. 83 (1847).

Galbula albirostris, Gray, List of Fiss. B. M. p. 67 (1848).

Galbula flavirostra, Cab. in Schomb. Guian. iii. p. 717 (1848).

Galbula chalcocephala, Deville, Rev. Zool. 1849, p. 55.

Galbula albirostris, Bp. Consp. i. p. 152 (1850).

Galbula albirostris, Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 308 (1851).

Galbula albirostris, Cassin, Cat. Halc. p. 17 (1852).

Galbula albirostris, Reich. Hand. d. sp. Orn. p. 85 (1852).

Galbula albirostris, Scl. Contr. Orn. 1852, p. 31, et Syn. Galb. p. 5 (1852).

Galbula albirostris, Bp. Consp. Vol. Zyg. p. 13 (1854).

Galbula albirostris, Scl. P. Z. S. 1855, p. 14.

Galbula chalcocephala, Des Murs, Zool. Exp. de Castelnau, Ois. p. 31, 9. fig. 2 (1855).

Galbula chalcocephala, Pelz. Sitz. Ak. Wien, xx. p. 517 (1856).

Galbula albirostris, Scl. Cat. A. B. p. 266 (1862).

Galbula albirostris, Cab. et Hein. Mus. Hein. iv. p. 225, et

Galbula chalcocephala, Cab. et Hein. loc. cit. p. 224 (1863).

Galbula albirostris, Scl. et Salv. P. Z. S. 1866, p. 192.

Galbula albirostris, Scl. et Salv. P. Z. S. 1867, pp. 582 et 751.

Galbula chalcocephala, Pelz. Orn. Bras. p. 24 (1871).

Galbula albirostris, Scl. et Salv. P. Z. S. 1873, p. 294.

Galbula albirostris, Scl. et Salv. Nomencl. p. 105 (1873).

Suprà æneo-viridis; alis intùs nigris, secundariis et tectricibus æneo-viridi limbatis; pileo rufescenti-cupreo; subtùs castanea, plagâ gulari quadratâ albâ; subalaribus rufis; caudâ brevi rotundatâ, rectricibus duabus mediis suprà dorso concoloribus, subtùs obscure viridibus, ceteris rufis extùs in margine externo viridi limbatis; rostro flavo, mandibulâ superiore plus minùsve nigrâ; pedibus rufis, unguibus nigris: long. tota 7·0, alæ 2·7, caudæ 2·5, rostri 1·6. *Fem.* mari similis, sed plaga gularis alba caret.

Hab. in Guianâ, Amazoniâ, et Æquatoriâ orientali.

As in the case of the last species, there are two forms of the present Jacamar, which may be readily distinguished when examples from the opposite ends of its range are compared. But as specimens from intermediate localities show somewhat intermediate characters, I have thought it better to keep all the forms under one specific designation.

The veteran ornithologist Latham was the original describer of the present bird, from a specimen in the collection of Dr. Hunter, under the name of the "White-billed Jacamar," which he afterwards Latinized as "*Galbula albirostris*." About the beginning of the century Audebert and Vieillot figured it in their 'Oiseaux Dorés,' and Levaillant in his 'Oiseaux de Paradis,' from examples received from Cayenne. Audebert and Vieillot called it "Le Venetou" from its native name, which is probably a corruption of Venador, the Spanish for "hunter," while Levaillant termed it "Le petit Jacamar, ou Jacamar à bec jaune." The latter designation was Latinized by Vieillot in 1817 as *Galbula flavirostris*. In 1838 Swainson again described the Guianan bird as *Galbula flavirostra*, and pointed out certain slight imperfections in the older descriptions, which led him to believe that his species was really different. But there can be no doubt that the three names above mentioned are completely synonymous.

The Upper-Amazonian form of this species, which may usually be distinguished by the base of the upper mandible being black like the apical half, and by the deeper colour of the crown, was named *Galbula chalcocephala* by Deville in 1849 from specimens obtained at Sararayaçu on the Ucayali during Castelnau's expedition; and this name has been generally adopted by those who regard the Amazonian bird as specifically distinct.

Schomburgk, who met with this species in Guiana, merely tells us that it does not differ in its habits from *G. viridis* and *G. ruficauda*. On the Lower Amazons *G. albirostris* does not seem to occur, but was obtained on the Rio Negro by Natterer at Marabitanas, Barra, and intermediate localities. Hr. v. Pelzeln has determined Natterer's specimens as *G. chalcocephala*; but a skin in my collection, procured by Mr. Wallace at Guia on the Rio Negro in 1850, can hardly be distinguished from the Guianan form, except by the upper portion of the base of the upper mandible above the nostril being blackish, and by a slightly deeper tinge on the crown. As regards the colour of the cheeks, to which attention is called by Hr. v. Pelzeln, I can perceive no difference. Natterer's notes tell us that the iris of this bird is dark brown.

On the Upper Amazons this Jacamar, in the phase called by Deville *G. chalcocephala*, seems to be rather abundant. Examples are before me obtained by Edward Bartlett at Chamicuros and Xeberos, and by Whitely at Yquitos; and I have seen many others. But the black base of the upper mandible cannot be considered a *constant* character of this form, as in one of the examples in my series the white base of the upper mandible for 0·2 inch beyond the nostrils is yellow, and there is very little more black on the apical portion than in the Guianan bird. At the same time the crown of the Upper-Amazonian form appears to be always of a somewhat deeper and more coppery hue.

In Messrs. Salvin and Godman's collection there is a pair of this species transmitted by Mr. C. Buckley from the Napo, in Ecuador. This is the furthest western locality yet known to me for this Jacamar.

The male of *G. albirostris* of the Guianan form is above of the usual brilliant metallic green which prevails throughout the group; and the wings, which are black in the inner

portion of their webs, are edged externally, except on the primaries, with the same colour. The crown of the head is of a coppery brown; and in certain lights there is a slight tinge of this colour also on the ear-coverts. Below, the body is of a deep uniform chestnut-red with a broad subquadrate bar of white on the throat. The chin is rufous, as are likewise the under wing-coverts and the inner margins of the wing-feathers. The tail is short and slightly rounded—the external pair of rectrices being diminutive, as usual in the genus, and only measuring about 1·9 inch from their insertion. The next pair are about 0·4 inch shorter than the remaining pairs, which are nearly equal in length. The bill and naked lores are yellow, the apical half of the upper mandible being black; the feet are yellow, and the claws black. In Rio-Negro specimens the black of the upper mandible is carried along the upper portion above the nostrils up to the front. This is also usually the case in specimens from the Upper Amazons. In the latter also the coppery tinge on the head is deeper, and the cheeks are pure green without any coppery gloss. In all the forms the female is distinguished from the male by the absence of the white throat-mark.

I add a list of the specimens of the Jacamar in the collections of myself and of Messrs. Salvin and Godman, together with their localities and dimensions:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♂	P. L. S.	Guiana (<i>Brown</i>).	7·0	2·8	2·5	1·6
2.	♂	P. L. S.	Guia, Rio Negro (<i>Wallace</i>).	7·7	2·9	2·9	1·7
3.	♂	P. L. S.	Yquitos (<i>Whitely</i>).	7·0	3·1	3·2	1·4
4.	♀	P. L. S.	Yquitos (<i>Whitely</i>).	7·0	2·9	2·8	1·5
5.	♂	P. L. S.	Chamicuros (<i>Bartlett</i>).	7·8	2·9	3·1	1·7
6.	♀	P. L. S.	Chamicuros (<i>Bartlett</i>).	7·3	2·9	2·9	1·7
7.	♂	S.-G.	Xeberos (<i>Bartlett</i>).	7·8	2·9	3·2	1·7
8.	♂	P. L. S.	Peruvian Amazons.	8·0	3·1	3·0	1·7
9.	♀	P. L. S.	Peruvian Amazons.	7·5	3·0	3·0	1·5
10.	♂	S.-G.	Napo (<i>Buckley</i>).	7·3	2·9	3·0	1·7
11.	♀	S.-G.	Napo (<i>Buckley</i>).	7·5	3·0	3·1	1·7

The specimens figured on the accompanying Plate are Nos. 1 and 9.



J. J. Verreaux del.

Hanhart imp.

GALBULA CYANEICOLLIS.

GALBULA CYANEICOLLIS.

THE BLUE-NECKED JACAMAR.

PLATE VIII.

Le Jacamar jeune âge, Levaill. Ois. de Par. ii. p. 113, t. 49 (1806)?

Galbula cyanicollis, Cassin, Pr. Ac. Sc. Phil. v. p. 154, t. 7 (1851).

Galbula cyanopogon, Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 308 (1851).

Galbula cyanicollis, Scl. Contr. Orn. 1852, p. 31, et Syn. Galb. p. 6 (1852).

Galbula cyanicollis, Cassin, Cat. Halc. p. 17 (1852).

Galbula cyanicollis, Scl. P. Z. S. 1855, p. 14.

Galbula cyanicollis, Pelz. Sitz. Ak. Wien, xx. p. 517 (1856).

Galbula albirostris, Burm. Syst. Ueb. iii. p. 301 (1856).

Galbula cyaneicollis, Scl. Cat. A. B. p. 267 (1862).

Galbula cyanopogon, Cab. et Hein. Mus. Hein. iv. p. 224 (1863).

Galbula cyanocephala, Licht. MS. (test. Cab. et Hein. loc. s. cit.).

Galbula cyaneicollis, Scl. et Salv. P. Z. S. 1867, p. 582.

Galbula cyaneicollis, Scl. et Salv. Nomencl. p. 105 (1873).

Suprà nitidè æneo-viridis nitore cupreo perfusa; alis intùs nigris, extùs (nisi in primariis) dorso concoloribus; pileo toto et colli lateribus purpureo-nigris, in nuchâ et in cervice laterali cæruleo lavatis; subtùs saturatè castanea unicolor; caudæ rotundatæ rectricibus duabus mediis suprà dorso concoloribus, subtùs obscurè viridibus; ceteris rufis, in pogonio externo æneo-viridi limbatis; subalaribus et remigum marginibus internis rufis; rostri flavi mandibulæ superioris dimidio apicali nigro; pedibus flavis, unguibus nigris: long. tota 7·8, alæ 3·1, caudæ 3·1, rostri a rictu 1·8. *Fem.* mari similis, sed abdomine pallidiùs rufescente diversa.

Hab. in Amazoniâ inferiore.

THE phenomenon of both sexes of a single species of a genus being clothed in the dress worn by the females of the remaining species is, though strange, not unfamiliar to naturalists who make special studies of certain groups. The present bird is an instance of the phenomenon in question. The ordinary point of difference between the sexes among the Jacamars is for the male to present a white patch on the throat, and for the female to be without it. This occurs not only in *Galbula* generally, but also in certain species of *Brachygalba* and in *Jacamerops*. But in the present bird the male has no trace of such a white throat-patch, and has the lower surface of a uniform chestnut-red, from which the female only diverges in its lighter tint of colour.

It is possible, as suggested by Messrs. Cabanis and Heine, that an individual of this species may have served for the model of Levaillant's figure of "*Le Jacamar jeune âge*" in his account of this group given in the second volume of his '*Oiseaux de Paradis*.' But the species was never properly understood until 1851, when Mr. Cassin, in America, and Dr. Cabanis, in Germany,

both described it about the same time under different names. The question of priority between these rival appellations is not an easy one to settle; but in my "Synopsis of the Galbulidæ," published in 1852, I decided it in favour of Mr. Cassin; and I see no reason to depart from that decision, in which I have been followed by Hr. v. Pelzeln.

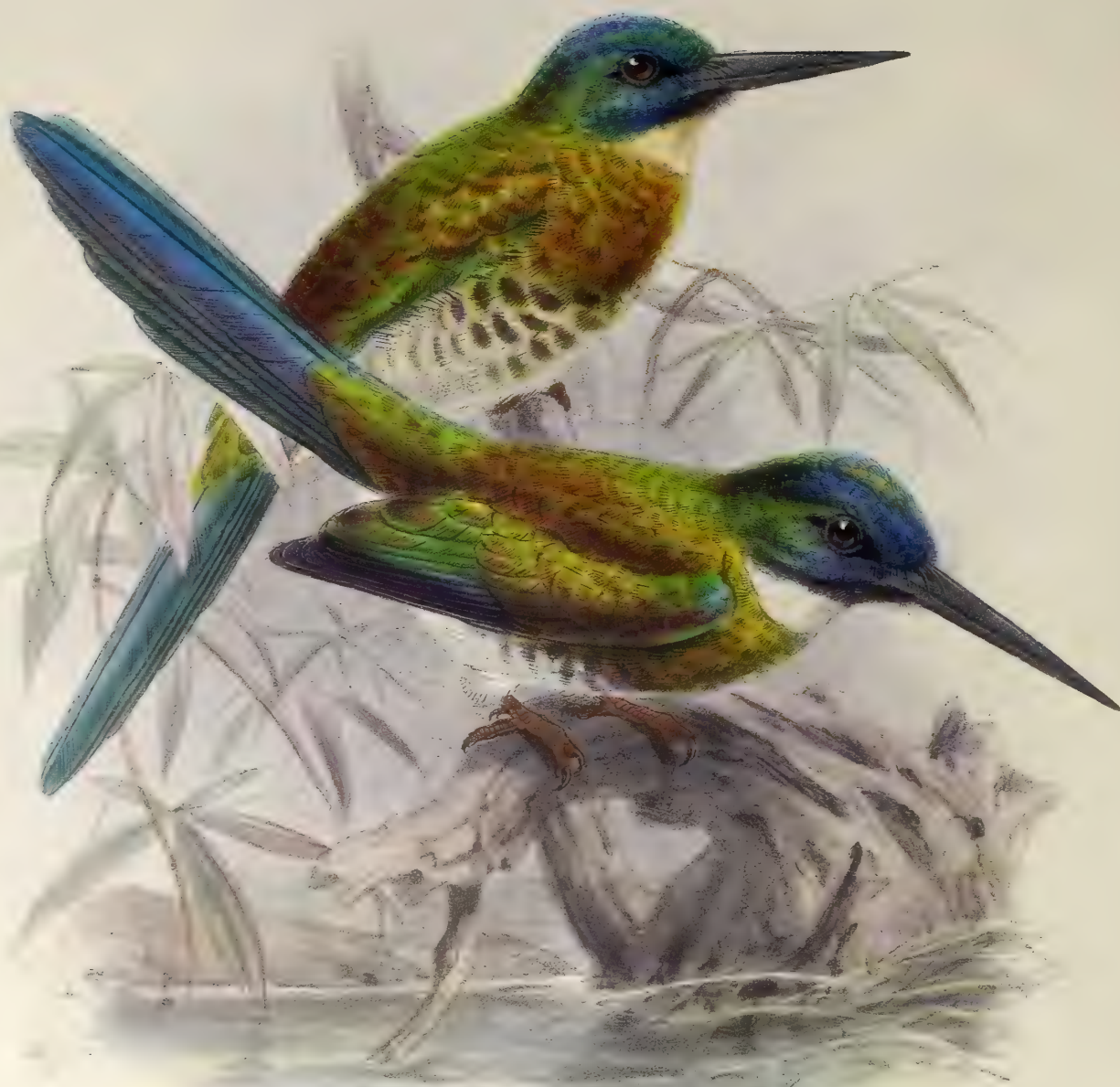
Mr. Cassin based his *G. cyanicollis* upon examples in the collection of the Philadelphia Academy of Natural Sciences received from Pará, and gave a tolerably accurate figure of the bird to accompany his description. Dr. Cabanis published the description of his *Galbula cyanopogon* in an article upon "*Galbula*" in the fifty-third volume of the first section of Ersch and Gruber's great 'Encyclopedia of the Natural Sciences,' to which we have already had frequent occasion to refer. Dr. Cabanis does not here state where the specimens which he describes are to be found, but gives their locality as Cametá near Pará. But in the footnote on this species, subsequently published in the 'Museum Heinianum,' we are told that the typical pair of Cabanis's *G. cyanopogon* are in the Berlin Museum, where they have also received from Lichtenstein the MS. name *Galbula cyanocephala*.

The great Austrian collector Johann Natterer obtained five examples of this Jacamar during his travels in Northern Brazil, at Borba on the Rio Madeira, on the Rio Negro, and at Manaqueri, Tapajoz, and Pará on the Lower Amazons. He notes the iris as dark brown, which seems to be the universal colour in this genus. Mr. Wallace obtained specimens of this bird during his expedition up the Capim river south of Pará. So far as I know, these are the only two naturalists that have met with this species, which is by no means common in collections.

In a male of *G. cyaneicollis* obtained by Mr. Wallace, the upper surface is of a brilliant metallic green with coppery reflections on the back; this colour likewise extends over the outer margins of the wing-feathers and wing-coverts, except on the primaries, which are blackish throughout. The upper part of the head is dull black with slight purplish reflections. On the nape, at the posterior edge of the black cap and on the sides of the neck beneath the eyes, the feathers are green suffused with a brilliant bluish purple. The whole under surface is of a deep chestnut-red, which is rather narrowed at the neck by the advancement of the purple colour above mentioned. The tail is generally of a chestnut-red; but the two middle tail-feathers are green like the back above, and dull green below; the others are all broadly margined with the same brilliant green externally. The diminutive outer pair of rectrices are about 1·2 inch in length from the insertion; they are rufous, with a slight greenish blotch at the tip. The bill and naked lores are yellow, with the apical half of the upper mandible blackish. The feet are yellow, and the claws black.

On the whole this Jacamar is certainly most nearly allied to *G. albirostris*, and has the same general structure. Burmeister, in his 'Systematic Review of the Animals of Brazil,' appears to have mistaken it for that species, and to have described it under that name.

The figure (Plate VIII.) is taken from the male specimen above described, which is the only one in my collection.



Harvard, imp

ALCEDO LEUCOGASTRA, ♂ et ♀

GALBULA LEUCOGASTRA.

THE WHITE-BELLIED JACAMAR.

PLATE IX.

Le Jacamar à ventre blanc, Levaill. Prom. et Guép. Suppl. p. 46, t. H (1807).

Galbula leucogastra, Vieill. Nouv. Dict. xvi. p. 444 (1817).

Galbula leucogastra, Vieill. Enc. Méth. p. 1326 (1823).

Galbula albiventris, Cuv. Règn. An. i. p. 448 (1829).

Galbula albiventer, Sw. An. in Men. p. 328 (1838).

Galbula leucogaster, Gray et Mitch. Gen. B. i. p. 83, et

Galbula albiventris, Gray et Mitch. ibid. t. xxix. (1847).

Galbula albiventer, Cab. in Schomb. Guian. iii. p. 717 (1848).

Galbula leucogastra, Gray, List of Fiss. B. M. p. 67 (1848).

Galbula leucogaster, Bp. Consp. i. p. 152, et

Galbula aenea, Temm. MS., teste Bp. ibid. (1850).

Galbula leucogastra, Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 309 (1851).

Galbula leucogastra, Cassin, Cat. Halc. p. 18 (1852).

Galbula leucogastra, Reich. Handb. d. sp. Orn. p. 87 (1852).

Galbula leucogastra, Scl. Contr. Orn. 1852, p. 32, et Syn. Galb. p. 6 (1852).

Galbula leucogastra, Bp. Consp. Vol. Zyg. p. 13 (1854).

Galbula leucogastra, Scl. P. Z. S. 1855, p. 14.

Galbula leucogastra, Pelz. Sitz. Ak. Wien, xx. p. 517 (1856).

Galbula leucogastra, Scl. Cat. A. B. p. 267 (1862).

Caucalias leucogaster, Cab. et Hein. Mus. Hein. iv. p. 218 (1863).

Galbula leucogastra, Scl. et Salv. P. Z. S. 1867, p. 582.

Galbula leucogastra, Pelz. Orn. Bras. p. 24 (1871).

Galbula leucogastra, Scl. et Salv. Nomencl. p. 105 (1873).

Suprà metallicè viridis cupreo lavata, pileo magis cærulescente; alis nigris, secundariis et tectricibus extùs dorso concoloribus; subtùs mento nigro; plagâ gutturis triangulari et ventre imo necnon remigum marginibus internis albis; pectore dorso concolori; caudâ gracili, cuneatâ, subtùs cineraceo-nigrâ, suprà æneo-viridi lavatâ, rectricibus lateralibus albo angustè terminatis; rostro et pedibus nigris: long. tota 7·5, alæ 2·9, caudæ 3·7, rostri a rictu 1·7. *Fem.* mari similis, sed crassitie paulo minore et gutture et ventre ochraceis diversa.

Hab. in Guianâ, Cayennâ, et Amazoniâ inferiore.

In the year 1806 the celebrated French traveller and naturalist François Levaillant completed his great illustrated work on the Birds of Paradise, to which were added monographs of the Rollers, Toucans, Barbets, and Jacamars. In the following year Levaillant issued a third
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volume, entitled 'Histoire Naturelle des Promerops et des Guépriers,' in which he continued his series of monographs, and added in a supplement figures and descriptions of some subsequently acquired species of the groups contained in the 'Oiseaux de Paradis.' Amongst these additional species was given the first account of the present Jacamar, of which Levaillant had then recently received examples from South America, under the name of "Le Jacamar à ventre blanc." Levaillant's French appellation was latinized by Vieillot in 1817, and by Cuvier in 1829, without any further information being given as to the species in question.

Richard Schomburgk was the first naturalist who seems to have met with *Galbula albiventris* in its native wilds. Swainson, in his 'Two Centenaries and a Quarter of birds either new or imperfectly described,' an essay attached to his volume on Animals in Menageries, published in Lardner's 'Cabinet Cyclopædia,' described the male of this Jacamar from one of Schomburgk's specimens as *Galbula albiventer*. In the third volume of Schomburgk's 'Reise in Britisch Guiana' this name was adopted, but the only information added was that in habits and ways of life the present species resembles the Jacamars previously spoken of, *i. e.* *G. viridis*, *Urogalba paradisea*, and others.

In 1847 the male of *Galbula leucogastra* was well figured in Gray and Mitchell's 'Genera of Birds' from a specimen in the British Museum.

In their excellent memoir on the Galbulidæ, given in the fourth part of the 'Museum Heineanum,' Messrs. Cabanis and Heine proposed to place this and the following species in a new genus, "*Caucalias*," on account of their "small bill, pointed wings, shorter tail, and peculiar coloration." There can be no question that these birds slightly diverge from the more typical species of *Galbula* in the points thus particularized, but not sufficiently, I think, to render a new generic appellation necessary. I have therefore decided to retain them in the genus *Galbula*.

The White-bellied Jacamar does not appear to be anywhere a very abundant species, although it has a tolerably wide distribution. Like most of the birds of Guiana and Cayenne it extends into Lower Amazonia. Our countryman Mr. Wallace obtained examples of it near Guia, on the Rio Negro; and the famous Austrian field-naturalist Johann Natterer met with it at Marabitanas, rather higher up the same river. Natterer also collected specimens of this Jacamar at Borba, on the Rio Madeira, in "the forest of the Campina." He found it solitary, in the months of July and August. He notes the bill and eye-ring in the male as black, and the iris dark brown, the feet nearly black, with the tarsi underneath at their bases passing into brown. In the female he describes the bill as black, the eye-ring as blackish grey, the iris "very dark brown," the feet "nearly black, passing slightly into violet."

In the male of *Galbula leucogastra* the plumage above is of a metallic green, most of the feathers on the back being broadly edged with coppery brown. This colour also extends over the outer edgings of the wing-coverts and secondaries, the primaries being of a dull black. Below the whole of the breast is of the same colour as the back: the chin is black, succeeded by a large triangular white patch which occupies the whole of the throat. The belly, under-wing-coverts, and inner margins of the wing-feathers are white. The bill, the naked lores, and the feet are apparently black. The female is rather smaller in dimensions, and has the throat-patch and belly of a pale ochraceous. The tail in both sexes is, on the lower surface, of a dark cinereous or dull black, on the upper surface, especially in the two middle rectrices, glossed with

metallic green. The lateral rectrices are slightly tipped with whitish, and on their inner webs towards their bases also narrowly margined with the same colour. The outer diminutive pair only measure 0·9 inch from their insertion, the next pair about 2·2.

The following are the dimensions of the specimens of this species in my own collection and that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♂	P. L. S.	Rio Negro (<i>Wallace</i>).	7·5	2·9	3·7	1·7
2.	♀	P. L. S.	Rio Negro (<i>Wallace</i>).	7·5	2·7	3·1	1·6
3.	♂	S.-G.	Cayenne.	7·6	2·9	3·7	1·7

The figures (Plate IX.) are from Nos. 1 and 2.



W. H. Sclater del.

GALEULA CHALCOTHORAX. ♂.

Hanhart imp

GALBULA CHALCOTHORAX.

THE BRONZY-CHESTED JACAMAR.

PLATE X.

Galbula chalcothorax, Scl. P. Z. S. 1854, p. 110.

Galbula chalcothorax, Scl. P. Z. S. 1855, p. 14.

Galbula leucogaster, Scl. P. Z. S. 1858, p. 61.

Caucalias chalcothorax, Cab. et Hein. Mus. Hein. iv. p. 218 (1863).

Galbula leucogastra, Scl. et Salv. P. Z. S. 1867, p. 978.

Galbula chalcothorax, Scl. et Salv. Nomencl. p. 105 (1873).

Galbula leucogastra, Tacz. P. Z. S. 1874, p. 548.

Suprà æneo-viridis purpurascente cupreo lavata, pileo cærulescenti-viridi; alis nigris, tectricibus et secundariis extûs dorso concoloribus; subtûs mento latè nigro; pectore toto purpurascenti-cupreo; gutturis plagâ magnâ quadratâ et ventre toto necnon remigum marginibus internis albis; caudâ suprâ æneo-viridi, subtûs cineraceo-nigrâ, rectricibus lateralibus albo angustè terminatis et in pogonio interno eodem colore limbatis; rostro et pedibus nigris: long. tota 8·5, alæ 3·3, caudæ 3·8, rostri à rictu 1·7. *Fem.* mari similis, sed gutture et ventre ochraceis.

Hab. in Amazoniâ superiore.

Obs. Similis *G. leucogastra*, sed crassitie majore et colore dorsi et pectoris diversa.

IN the present bird we have another instance of a Guianan species being replaced in Upper Amazonia by a larger and more highly developed form, just as has been previously spoken of in the case of *Urogalba amazonum*. The difficulty in such cases is to decide whether it is better to recognize the form as specifically distinct or not. Different writers will take different views on these questions; and even the same writer is liable to alter his opinion upon such a point from time to time.

Galbula chalcothorax was first described as an independent species in a paper which I read before the Zoological Society of London in 1854, upon a collection of birds received by Mr. Gould from the province of Quixos, in Eastern Ecuador. In some subsequent communications to the Zoological Society upon Upper-Amazonian birds, Mr. Salvin and I did not distinguish this bird from *G. leucogastra*. But shortly before the publication of our 'Nomenclator Avium Neotropicalium' we had convinced ourselves, after the examination of fresh specimens, that the form was entitled to specific distinction; and we accordingly gave it a place in that work.

In the fourth part of the 'Museum Heinianum' Messrs. Cabanis and Heine arranged this bird quite correctly as a second species of their genus *Caucalias*; but they do not appear to have met with examples of it.

From Eastern Ecuador *G. chalcothorax* extends over the forests drained by the Peruvian Amazons or Marañon. Mr. Hauxwell obtained examples of it at Pebas; and I have seen specimens of it in other collections from Upper Amazonia.

The upper plumage of *G. leucogastra* is generally of a dark rich shining copper. This colour extends over the upper wing-coverts; but the head, the outer margins of the secondaries, and the upper surface of the tail-feathers are of a metallic green with bluish reflections in some lights. The primaries are of a dull black. The black chin seems to be wider in extent than in *G. leucogastra*, rendering the white throat-patch rather square in form: the breast is coloured like the back. The lower belly is white, the feathers at their bases being black, but broadly tipped with white. The inner margins of the remiges are also white; but the under wing-coverts are blackish. The under surface of the tail is slaty black, the outer rectrices on each side having the tips and adjacent inner margins of the inner webs of a more or less decided white. The bill and feet are black. The outer (abnormal) pair of rectrices are about an inch in length from their insertion, the second pair rather more than two inches.

In the female, as in the preceding species, the throat-patch and belly are of a pale yellowish fulvous.

The following are the dimensions of the examples of this species in my own collection and that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♂	P. L. S.	Quixos (<i>Gould</i>).	8·5	3·3	3·8	1·7
2.	♂	S.-G.	Quixos (<i>Gould</i>).	9·0	3·2	3·8	1·8
3.	♂	S.-G.	Pebas (<i>Hauxwell</i>).	8·0	3·2	3·6	1·6
4.	♀	P. L. S.	Elvira, E. Peru (<i>Hauxw.</i>).	8·3	2·9	3·7	1·7

The specimen figured on Plate X. is No. 1.



Hanhart imp

BRACHYGALBA LUGUBRIS, ♂ et ♀.

BRACHYGALBA LUGUBRIS.

THE MOURNFUL JACAMAR.

PLATE XI.

- Galbula lugubris*, Sw. An. in Men. p. 329 (1838).
Galbula lugubris, Gray et Mitch. Gen. B. i. p. 83 (1847).
Galbula lugubris, Cab. in Schomb. Guian. iii. p. 718 (1848).
Jacamaralcyon lugubris, Gray, List. of Fiss. B. M. p. 67 (1848).
Galbula lugubris, Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 309 (1851).
Galbula inornata, Scl. Contr. Orn. 1852, p. 32, et Syn. Galb. p. 7, et
Jacamaralcyon lugubris, Scl. loc. cit. (1852).
Jacamaralcyon inornata, Cassin, Cat. Halc. p. 18 (1852).
Galbula chalcoptera, Reich. Handb. d. sp. Orn. p. 84, et
Jacamaralcyon lugubris, Reich. loc. cit. (1852).
Brachygalba inornata, Scl. P. Z. S. 1855, p. 15.
Galbula inornata, Pelz. Sitz. Ak. Wien, xx. p. 518, et
" *Galbula tristis*, Natt. MS." teste Pelzeln, loc. cit. (1856).
Brachygalba inornata, Scl. Cat. A. B. p. 267 (1862).
Brachycex lugubris, Cab. et Heine, Mus. Hein. iv. p. 215 (1863).
Brachygalba inornata, Scl. et Salv. P. Z. S. 1867, pp. 582 et 978.
Galbula inornata, Pelz. Orn. Bras. p. 24 (1871).
Brachygalba inornata, Scl. et Salv. Nomencl. p. 105 (1873).

Suprà nigricanti-fusca ferè unicolor, alis caudâ et hujus tectricibus extûs purpurascente æneo lavatis; subtûs vix dilutior, in pectore paulûm rufescens; abdomine medio albo, crisso et lateribus saturatè nigricanti-fuscis; remigum maculâ internâ ad basin albâ; rostro et pedibus nigris: long. tota 7·0, alæ 2·6, caudæ 2·0, rostri a rictu 1·8. Fem. mari similis, sed abdomine medio rufo.

Hab. in Guianâ, Venezuelâ, Colombiâ, et Amazoniâ.

WITH the present species we commence a series of Jacamars which, although closely allied to the preceding in every essential point of their structure, present sufficient differences, especially as regards their short square tail and diminutive size, to entitle them to generic separation. In 1854 Prince Bonaparte, in his arrangement of the Jacamars given in his 'Conspectus Volucrum Zygodactylorum,' designated them by the name *Brachygalba*. This very unclassically formed compound Messrs. Cabanis and Heine in 1863 proposed to alter into *Brachycex*; and it is, indeed, somewhat doubtful whether we are not justified in violating the ordinary rules of priority in dealing with such vile barbarisms. On the whole, however, *Brachygalba* is perhaps sufficiently "like Latin" to pass muster.

The Jacamar now before us, which is the earliest and best-known species of this little group, was first described by Swainson in 1838 from a specimen procured by Schomburgk in British

Guiana. Swainson, however, expressly mentions his *Galbula lugubris* as having only three toes; and it was this error that induced both Reichenbach and myself to redescribe the species in 1852 under other names. Having, however, subsequently received a specimen of this Jacamar from British Guiana, the locality of *G. lugubris*, I have quite convinced myself that Reichenbach's *Galbula chalcoptera* and my *G. inornata* are identical with Swainson's species, and that Swainson's title ought to stand.

It appears, however, that none of Schomburgk's examples of this Jacamar reached the Berlin Museum, where the greater portions of his collections were preserved, as Cabanis tells us that the specimens at Berlin are from Venezuela.

From Guiana and Venezuela this species appears to extend far into the interior of Colombia, and over the Amazonian provinces of Ecuador and Peru. It is not uncommon in "Bogota" collections; but whether the skins thus imported are obtained from the valley of the Magdalena or from the southern slopes of the Colombian Andes it is impossible to say. Most probably, however, they are from the latter district, as the bird has not occurred to my knowledge in any of the collections formed in the northern States of the Colombian Union.

In Upper Amazonia *Brachygalba lugubris* has been obtained by Hauxwell near Pebas, on the Mara  n, and by Buckley in Western Ecuador. In Lower Amazonia Wallace met with it in 1848 at Bai  o, on the Rio Tocantins (see his 'Travels on the Amazon,' p. 60), and Natterer on the Rio Branco to the south of the Serra Carauman. Parties of about three individuals were observed by Natterer sitting on small branches of trees near the water in the month of June. Natterer notes the iris as "dark brown" in the male, and "dark bluish grey" in the female, the bill, eye-ring, and feet as "black" in both sexes. Natterer called this Jacamar *Galbula tristis* in his MS. journal.

Besides these notes of Natterer, the only authority on the habits of this species is Schomburgk, who merely tells us that in this respect it does not differ from other birds of the same group.

The male of this Jacamar is above of a nearly uniform dark chocolate-brown with dark green metallic edgings to the wings, tail, and upper tail-coverts; the colour below is slightly rufescent on the breast and of a deeper black on the sides of the belly and crissum, the middle of the abdomen being pure white, as is likewise a narrow band along the inner bases of the wing-feathers. The bill and legs are black. In the female the patch on the middle of the belly is rufous instead of white.

The following list gives the localities and dimensions of the examples of this species in my collection and in that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	al��,	caud��,	rostri.
1.	��	P. L. S.	British Guiana (<i>Brown</i>).	6��0	2��8	2��0	1��9
2.	��	P. L. S.	Bogota.	5��5	2��8	1��9	1��7
3.	��	P. L. S.	Bogota.	5��7	2��8	2��1	1��7
4.	��	P. L. S.	Incerta.	6��4	2��7	2��0	1��8
5.	��	S.-G.	Pebas (<i>Hauxwell</i>).	6��5	2��7	2��1	1��8
6.	��	S.-G.	Pebas (<i>Hauxwell</i>).	6��3	2��7	2��0	1��8
7.	��	S.-G.	Ecuador (<i>Buckley</i>).	6��4	2��8	2��1	1��9
8.	��	P. L. S.	Rio Napo.	5��8	2��7	1��9	1��6
9.	��	S.-G.	Ecuador.	6��0	2��9	2��0	1��6

The specimens figured (Plate XI.) are Nos. 4 and 8.



Hanhart imp.

BEACHYGALEA GOERINGI, ♂ et ♀

BRACHYGALBA GOERINGI.

GÖRING'S JACAMAR.

PLATE XII.

Brachygalba goeringi, Scl. et Salv. P. Z. S. 1869, p. 253, pl. xviii.

"*Brachygalba lugubris* (Sw.)," Lawr. Ann. Lyc. N. Y. ix. p. 274 (1869).

Brachygalba goeringi, Scl. et Salv. Nomencl. p. 105 (1873).

Suprà æneo-viridis; capite colloque toto fuscis, superciliis indistinctis et nuchâ paulò dilutioribus flavicanti tinctis; subtùs nigricans, gutture et ventre medio cum crisso albis; plumis in ventre medio ferrugineo tinctis; subalaribus nigris, remigibus intùs ad basin albis; rostro et pedibus nigris: long. tota 7·0, alæ 2·75, caudæ 2·3, rostri a rictu 2·0. *Fem.* mari similis, sed ventre medio ferè omnino ferrugineo.

Hab. in Venezuelâ ad littora lacûs Valenciæ.

For the discovery of this Jacamar we are indebted to the exertions of Anton Göring, a well-known German artist and naturalist, who formerly travelled along with Burmeister in the Argentine Republic, and afterwards passed several years in Venezuela. Göring met with this species on the shores of the Lake of Valencia, a sheet of water situated in the coast-range of the Venezuelan Andes to the south of Puerto Cabello, to which he made excursions from San Esteban, a village six miles inland from Puerto Cabello. In the notes accompanying the descriptions of this and other birds from the same locality by Mr. Salvin and myself, read before the Zoological Society of London in 1869, Mr. Göring tells us that the Lake of Valencia seems to be a favourite station for the birds of the llanos and river-districts of Venezuela in the dry season, when thousands of feathered visitors resort to it. "The mountains to the south of the lake, the Serra Azul of Guigac, are tenanted by the same species of birds as the adjoining coast-range; but the vegetation is not so rank, and those of small size are not so numerous. Most of the species are different from those of Eastern Venezuela." Near Maruria, at the foot of the Serra of Guigac, this Jacamar was met with by Mr. Göring in pairs in the month of October 1878, the two birds sitting close to each other on the branches of trees. The iris is noted as "red-brown," and the bill, legs, and feet as "black."

The only other collector who appears to have obtained an example of this Jacamar is Mr. W. B. Gilbert, who accompanied the Venezuelan branch of Professor Orton's Amazonian Expedition in 1868. Mr. Gilbert's specimen, which has been deposited in the Museum of Vassar College, was also obtained at Valencia. It is referred by Mr. Lawrence (*l. s. c.*) to the *Galbula lugubris* of Swainson. But this view I cannot agree to. Swainson's description seems to me to agree in every respect much better with the species which I formerly called *Galbula inornata* than with the present bird. And having, as already stated, now received an example

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of my *G. inornata* from British Guiana (the same locality as that of Schomburgk's *G. lugubris*), I think there can be no reasonable doubt that the two species are identical.

The general colour of Göring's Jacamar above is dull black, glossed with metallic green over the whole of the back, wing-coverts, external secondaries, and tail-feathers. The whole head above, with the neck and sides of the head, are of a smoky brown, with lengthened superciliaries and ear-coverts passing into rufescent brown, of which colour there are also some traces on the nape. Below the general colour is dark brownish black, the whole of the throat and middle of the belly, including the crissum, being of a pure white, as is likewise a small patch covering the basal portion of the inner webs of the remiges. The bill, legs, and feet are black. In the male which I originally described, as likewise in another example in collection of Messrs. Salvin and Godman marked as being of the same sex, there is a small ferruginous patch on the middle of the belly. It is probable, however, that this colour, which merely occupies the tips of the feathers, would disappear in the perfectly adult male, and leave the belly quite white. In the female, which is generally similar to the male, this reddish brown patch is much more extended, and occupies the whole of the middle of the belly.

The following are the dimensions of the specimens of this Jacamar in my own collection and that of Messrs. Salvin and Godman. The examples figured are the two first on the list.

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♂	P. L. S.	L. of Valencia (<i>Göring</i>).	7·0	2·7	2·3	1·8
2.	♀	P. L. S.	L. of Valencia (<i>Göring</i>).	7·0	2·7	2·2	1·9
3.	♂	S.-G.	L. of Valencia (<i>Göring</i>).	6·5	2·8	2·2	1·9
4.		S.-G.	L. of Valencia (<i>Göring</i>).	6·5	2·7	2·2	1·9



BRACHYGALBA SALMONI.

SALMON'S JACAMAR.

PLATE XIII.

Brachygalba salmoni, Scl. et Salv. P. Z. S. 1879, p. 535.

Æneo-viridis, pilei plumis fusco adumbratis; gutture toto et remigum marginibus internis ad basin albis; ventre medio et crisso castaneis; rostro nigro, pedibus fuscis: long. tota 7·2, alæ 2·8, caudæ 2·3, rostri a rictu 1·8.

Hab. in Statu Antioquiæ reipubl. Columbianæ.

THE late Thomas Knight Salmon, after whom this Jacamar is called, was brought up as a mechanical engineer in the works of the London and North-Western Railway Company at Wolverton, and was for some years foreman of an engineering establishment at Guildford. Being compelled to abandon his profession from delicacy of the lungs, he devoted himself to natural history, to which he had always shown a great liking from boyhood, and opened a naturalist's shop at Guildford. After some years passed here, Mr. Salmon's health rendering it necessary for him to seek a milder climate, he proceeded in 1870 to Medellin, the capital of the State of Antioquia, U. S. of Colombia, where, for seven years he was more or less continuously resident, in the service of the State Government as engineer. But Mr. Salmon's heart was in the wilds, and he devoted the whole of his leisure time to collecting-excursions to different places round Medellin, where extensive collections of mammals, birds, insects, and other objects were made and forwarded to his agent in this country, Mr. Edward Gerrard, jun. Mr. Salmon's collections of birds were very large, numbering some 3500 skins, and formed the subject of a memoir by myself and Mr. Salvin, which was read at the meeting of the Zoological Society of London on the 3rd of June 1879.

Among the fourteen new species of birds, for our knowledge of which we are indebted to Mr. Salmon's energetic researches, and of which a list is given in the memoir above referred to, few are perhaps of greater interest than the present Jacamar, which Mr. Salvin and I have proposed to dedicate to the memory of its discoverer. Although closely allied to Göring's Jacamar, it is, I think, without doubt a distinct species, readily distinguishable by the extension of the green of the back over the head and front, instead of these parts being of an earthy brown. It is likewise a near relative of *Brachygalba lugubris*, but is easily known from that species by its white throat.

Mr. Salmon obtained both his examples of this Jacamar (the only individuals of the species, so far as I know, yet received in Europe) during one of his excursions from Medellin to the Rio Neche, to the north of that city. The Rio Neche or Nechi is a confluent of the Rio Poru, a branch of the Magdalena, which it enters at Dos Bocas; and Mr. Salmon's collecting-place was,

I believe, a few miles above the confluence of the two streams. Mr. Salmon's specimens are marked male and female, but are scarcely different from each other. It is very probable that they are immature, and that the adult male would have the middle of the abdomen white; but this is by no means certain, as the most closely related species occasionally disagree on such points.

The example of Salmon's Jacamar in my collection, from which the figure on Plate XIII. has been taken, is above of a nearly uniform dull green with slight metallic reflections, except on the primaries. Below the chest is of the same colour, while the chin and throat are white slightly tinged with pale rufous, and the whole of the middle of the belly, extending over the crissum, is of a deep ferruginous red. The flanks, under wing-coverts, and under surface of the wings are of a dull black, the under surface of the primaries and secondaries being crossed at the base by a white band. The bill and feet are black; the iris is marked "dark." In the second example, marked "male" (in the collection of Messrs. Salvin and Godman), the ferruginous colour is but slightly shown on the crissum; but this may be caused by the feathers on this part not being quite perfect. The dimensions do not differ from those of the other specimen.



Lindert sc.

BRACHYGALBA ALBIGULARIS

BRACHYGALBA ALBIGULARIS.

THE WHITE-THROATED JACAMAR.

PLATE XIV.

Galbula albogularis, Spix, Av. Bras. i. p. 54, t. 57. fig. 1 (1824).

Galbula albogularis, Gray & Mitch. Gen. B. i. p. 83 (1847).

Galbula albigularis, Bp. Consp. i. p. 152 (1850).

Galbula albigularis, Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 309 (1851).

Galbula albigularis, Reich. Handb. d. sp. Orn. p. 84 (1852).

Brachygalba albigularis, Bp. Consp. Vol. Zyg. p. 13 (1854).

Galbula albogularis, Burm. Syst. Ueb. ii. p. 302 (1856).

Brachygalba albigularis, Scl. P. Z. S. 1857, p. 262.

Brachygalba albigularis, Scl. Cat. A. B. p. 267 (1862).

Brachycex albigularis, Cab. et Heine, Mus. Hein. iv. p. 215 (1863).

Brachygalba albigularis, Scl. et Salv. Nomencl. p. 105 (1873).

Obscurè fuliginosa; dorso, alis extūs, nisi in primariis, et caudæ marginibus æneo-viridibus; superciliis, capitis lateribus et gulâ angustâ albis; abdomine nigro æneo-viridi tincto, et plagâ mediâ ferrugineâ instructo; remigum paginâ inferiore ad basin albo transvittatâ; rostro albo; pedibus nigris: long. tota 6·2, alæ 2·7, caudæ 2·1, rostri a rictu 2·4.

Hab. in Amazoniâ superiore.

IN 1824, among the many new birds which were the results of the celebrated Brazilian Expedition of Spix and Martius, Spix described and figured a small Jacamar, of which he gave the locality as "Pará," under the name *Galbula albigularis*. Some years ago I examined the typical specimen of Spix's species in the Royal Museum at Munich, and came to the conclusion, as I stated in my Synopsis of the Jacamars published in 1853, that it was only a young example of *Urogalba paradisea*. But a few years afterwards I was led to believe that this conclusion was wrong, and that Spix's *Galbula albigularis*, though not to be found at Pará, was an authentic species. In a collection of birds transmitted from Ega, on the Upper Amazons, by Mr. H. W. Bates in 1857, of which I gave an account in the 'Proceedings' of the Zoological Society of London for that year, were two examples of a small Jacamar from the Rio Javári. On examining these—one of which I obtained for my own collection, while the other passed into that of the British Museum—and comparing them with Spix's description of his *Galbula albigularis*, I was obliged to acknowledge that my former supposition was probably erroneous. The Rio-Javári bird seemed to fit Spix's description very fairly, and, as Spix's localities are notoriously not very reliable, was probably the same as that which he obtained, not at Pará, but either at Ega or somewhere in the Upper-Amazonian district. No other

collector, however, except Mr. Bates, seems to have met with examples of this species; nor have I seen specimens of it in any of the continental museums. Mr. Bates, I may remark, did not himself visit the Rio Javári, but obtained the birdskins thus labelled from a French collector who ascended that stream.

The specimen of *Brachygalba albigularis* in my own collection, which is also the subject of the accompanying Plate (XIV.), is above generally of a dull black, with metallic green edgings to the feathers on the back, wings, and tail, except on the primaries. This colour passes into earthy brown on the upper surface of the head and nape. The narrow superciliaries and the whole of the sides of the head, along with the upper part of the throat, are white. The lower surface of the body generally is darker than the upper, but has slight metallic greenish reflections. In the middle of the abdomen is a distinct elongated chestnut patch; but, if Spix is correct, this is peculiar to the female sex, and is wanting in the male bird. The under surface of the wings and under wing-coverts are black, with a well-defined band along the bases of the remiges. The rectrices, excepting the two abnormal outermost, are of about equal length, forming a nearly square tail-end. The bill is rather stouter than in the foregoing species of the genus, and white in colour. The feet are apparently black; but the tibio-tarsal joint shows some indications of having been red in the living bird.

It is much to be regretted that so little is known of this interesting bird; but there appears to be no doubt, whatever Spix's type may turn out to be, that it is a perfectly valid species, most nearly allied to *B. melanosterna*, but to be at once distinguished by the white supercilia and sides of the head.



J. Gouldenae del.

Hanhart imp.

BRACHYGALBA MELANOSTERNA, ♂

BRACHYGALBA MELANOSTERNA.

THE BLACK-CHESTED JACAMAR.

PLATE XV.

Jac. à ventre blanc, "*Galbula albiventris*, Cuv.," Less. Trait. d'Orn. p. 234 (1831).

Galbula albiventris, Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 309 (1851).

Brachgalba albiventer, Bp. Consp. Vol. Zyg. p. 13 (1854).

Brachygalba melanosterna, Scl. P. Z. S. 1855, p. 15.

Galbula (Brachygalba) melanosterna, Pelz. Sitz. Ak. Wien, xx. p. 518, et

"*Galbula tristis*, Natt. MSS.," teste Pelz. loc. cit. (1856).

Brachycex melanosterna, Cab. et Hein. Mus. Hein. iv. p. 214, et

Brachycex albiventris, Cab. et Hein. loc. cit. (1863).

Galbula melanosterna, Reinh. Fuglef. Bras. Camp. p. 123 (1870).

Galbula (Brachygalba) melanosterna, Pelz. Orn. Bras. p. 24 (1871).

Brachygalba melanosterna, Scl. et Salv. Nomencl. p. 105 (1873).

Suprà fuliginoso-fusca, interscapulio, alis extùs et caudâ æneo marginatis; subtùs nigra, nitore nonnullo in pectore æneo; mento albo, gutture in fuscum transeunte; ventre medio purè albo; remigum paginâ inferiore ad basin albo transvittatâ; rostro albo, mandibulâ superiore basin versùs fuscâ; pedibus fuscis: long. tota 6·1, alæ 2·9, caudæ 2·2, rostri a rictu 1·9.

Hab. in Brasiliâ interiore et in Boliviâ orientali.

I FIRST became acquainted with this Jacamar in 1854, from examples contained in the collection of the late Professor Behn, of Kiel, which had been obtained by that naturalist during his travels in the Brazilian province of Goyaz, and described it shortly in my "Remarks on the Jacamars" published in the Zoological Society's 'Proceedings' for 1855. At the same time I remarked that I had seen in the Museum of the Jardin des Plantes at Paris a specimen brought by d'Orbigny from Guarayos, in Bolivia, which I was also inclined to refer to the same species, although I had previously alluded to it as a variety of *Brachygalba lugubris*.

Since 1855 I have had further opportunities of examining the above-mentioned specimen of d'Orbigny, and have convinced myself that it really belongs to the present species. There is also in the same collection the typical example of "*Galbula albiventris*, Cuv.," as described by Lesson in his 'Traité d'Ornithologie.' This bird, I find, which was obtained by Auguste St.-Hilaire in the Brazilian province of Goyaz, also belongs undoubtedly to *Brachygalba melanosterna*. But the name *albiventris*, although given before *melanosterna*, cannot be used for the present species, as it was originally applied by Cuvier not to the specimen described under that name by Lesson, but to Levaillant's "*Jacamar à ventre blanc*," i. e. to *Galbula leucogastra*.

Besides d'Orbigny and St.-Hilaire, a third well-known South-American explorer has met

with this species. During his fifth journey in the interior of Brazil in 1823, Natterer found it abundant in the months of April and May at Porto do Rio Paraná, on the Rio Grande, just within the confines of the province of Minas Geraes. Natterer tells us that it is common on the banks of the river, in small flocks, usually of two or three individuals, though upon one occasion more than thirty were observed together. They sit upon the dry twigs of the highest trees, and hunt after butterflies. In the morning they occasionally descend to the sandy flats by the water to bathe. Natterer describes a female as having the bill pale brownish yellow, with the point, a long spot in the middle, which is three times as long in the upper mandible, and the space round the nostrils blackish brown; the nostrils circular; the tongue thin, small, and pointed, one third of the length of the bill; the naked ring round the eye blackish brown; the feet black, and the base of tarsi yellowish. In one specimen almost the whole of the upper mandible was dark brown; in another the front half of the lower mandible was black.

In Professor Reinhardt's excellent treatise on the avifauna of the campos of Brazil we are told that Dr. Lund sent to Copenhagen a single female example of this Jacamar, obtained in August 1834 near São Domingo, in the south-western corner of Minas Geraes, near the confines of Goyaz. This would be a little north of the district where Natterer met with it.

The male of *Brachygalba melanosterna* is above of a dark sooty brown, with the middle of the back and edging of the wings and tail, except on the primaries, glossed with dark bronzy green; on the sides of the head the brown is rather lighter, and the chin and upper part of the throat are quite white with a slightly rufescent lower margin; the rest of the body below is of a deep black, with a slight bronzy wash on the breast, a large patch of pure white occupying the centre of the belly, but not extending onto the crissum. The under surfaces of the wings and tail are black, a narrow white band crossing the remiges at their bases. In the dried skin the bill is of a pale whitish horn-colour, with a longitudinal dark patch running along the upper mandible on each side; the feet are dark brown.

I have not yet had an opportunity of examining a female of this species, which is still rare in collections; but Hr. v. Pelzeln has kindly informed me that, judging from Natterer's marked specimens in the Imperial Cabinet at Vienna, there is little difference between the sexes, the female being slightly smaller in dimensions.

This second species of the white-billed section of the genus *Brachygalba* may be readily distinguished from *B. albigularis*, the only other known species of the group, by the sides of the head being brown, and the white being restricted to the upper portions of the throat.

The following are the dimensions of the two examples of the present species in my own collection. The figure (Plate XV.) is taken from Natterer's specimen.

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♂	P. L. S.	Rio Paraná (<i>Natt.</i>).	6·2	2·9	2·2	1·9
2.	♂	P. L. S.	Bolivia.	7·0	2·8	2·1	1·8



Sclater

Hanhart imp

TACAMARALCYON TRIDACTYLA

JACAMARALCYON TRIDACTYLA.

THE THREE-TOED JACAMAR.

PLATE XVI.

Le Jacamaralcion, Levaill. Prom. et Guêp. Suppl. p. 51, t. L. (1807).

Galbula tridactyla, Vieill. Nouv. Dict. xvi. p. 445 (1817).

Galbula tridactyla, Licht. Verz. Doubl. p. 12 (1823).

Galbula tridactyla, Vieill. Enc. Méth. p. 1327 (1823).

Galbula tridactyla, Spix, Av. Bras. i. p. 55, t. 57. fig. 2 (1824).

Galbula ceycoides, Such, Zool. Journ. ii. p. 112 (1826).

Galbula ceycoides, Jard. et Selb. Ill. Orn. i. t. 22 (1830?).

Jacamaralcion brasiliensis, Less. Traité d'Orn. p. 235 (1831).

Galbula armata, Swains. An. in Men. p. 328 (1839).

Cauax tridactylus, Cab. in Wieg. Arch. 1847, i. p. 347.

Galbula tridactyla, Gray et Mitch. Gen. B. i. p. 83 (1847).

Jacamaralcion tridactyla, Gray, List of Fiss. B. M. p. 67 (1848).

Jacamaralcion tridactyla, Bp. Consp. i. p. 153 (1850).

Cauax tridactylus, Cab. in Ersch u. Grub. Enc. sect. 1, p. 310 (1851).

Jacamaralcion tridactyla, Reich. Handb. d. sp. Orn. p. 83 (1852).

Jacamaralcion tridactyla, Scl. Syn. Galb. p. 8 (1852).

Jacamaralcion tridactyla, Cassin, Cat. Halc. p. 18 (1852).

Jacamaralcion tridactyla, Bp. Consp. Vol. Zyg. p. 18 (1854).

Jacamaralcion tridactyla, Scl. P. Z. S. 1855, p. 16.

Galbula tridactyla, Pelz. Sitz. Ak. Wien. xx. p. 518 (1856).

Jacamaralcion tridactyla, Scl. Cat. A. B. p. 268 (1862).

Cauax tridactylus, Cab. et Hein. Mus. Hein. iv. p. 213 (1863).

Galbula tridactyla, Euler, Journ. f. Orn. 1867, p. 221.

Jacamaralcion tridactyla, Reinh. Fuglef. Bras. Camp. p. 123 (1870).

Galbula tridactyla, Pelz. Orn. Bras. p. 25 (1871).

Jacamaralcion tridactyla, Scl. et Salv. Nomencl. p. 105 (1873).

Cauax tridactylus, Cab. Journ. f. Orn. 1874, p. 227.

Suprà schistaceo-nigra æneo perfusa; pileo ochracecente fusco striato; subtus paulo dilutior, gutture nigro, mento et lateribus capitis fusco striatis, abdomine medio purè albo; rostro nigro, pedibus obscure schistaceis: long. tota 7·5, alæ 2·8, caudæ 2·8, rostri a rictu 1·9.

Hab. in Brasiliæ meridionali-orientalis prov. internis.

THE occurrence of monotypic forms in the subregion of South-eastern Brazil is a fact well known to the student of neotropical ornithology. *Tijuea* and *Phibalura* among the Cotingidæ, *Calyptura*

among the Pipridæ, and *Biatas* among the Formicariidæ are familiar instances of this phenomenon. In the present bird we meet with another example of the same character, and with one, perhaps, more isolated in its structure than any of those above mentioned, *Jacamaralcyon* being notably different from all other members of the Galbulidæ in the absence of the hallux. At the same time we must be careful not to put too high a value upon this, at first sight, seemingly important character, as the same feature occurs, as is well known, not only in certain genera of other allied families (such as the Alcedinidæ and Picidæ), but even in a genus of Oscines (*Cholornis*), in which group the foot-structure is generally of a very uniform character.

We are indebted to the well-known French collector Delalande (whose name is commemorated in that of the beautiful Humming-bird *Cephalolepis delalandii*) for the discovery of the Three-toed Jacamar. Levaillant, who first described and figured it in one of the supplementary plates of his 'Oiseaux de Paradis' added to his 'Histoire Naturelle des Promerops et Guêpiers,' based his description upon Delalande's specimens. Vieillot, who first gave this species a scientific name, likewise refers to Delalande's examples in the Paris Museum.

In 1826 the Three-toed Jacamar received a second scientific appellation from Dr. Such, who, in that year, published a number of somewhat hastily drawn-up descriptions of Brazilian birds in the 'Zoological Journal.' Dr. Such called this Jacamar *Galbula ceycoides*; and it was shortly afterwards figured by Jardine and Selby, in their 'Illustrations of Ornithology,' under the same name, from Dr. Such's specimens. In 1839 Swainson, who ought to have been acquainted with Such's description at least, gave it a third name, and called it *Galbula armata*, from the spines on the carpal joint, which are somewhat more prominent than in other Galbulidæ.

Lesson in 1831 elevated the Three-toed Jacamar to the rank of a genus, adopting for its scientific appellation the term "*Jacamaralcyon*," originally given to it by Levaillant. The name is certainly not classical, but being declinable, need not, I think, be superseded by *Cauax*, which Cabanis proposed for the same bird in 1847. I prefer to follow Bonaparte in writing Lesson's generic with Vieillot's specific term, and to call the bird *Jacamaralcyon tridactyla*.

As regards the habits and distribution of *Jacamaralcyon tridactyla* further information is, as in the case of most of this group, much to be desired. Prince Maximilian of Neuwied, our best authority on the birds of the wood-region of South-eastern Brazil, did not meet with this species in the districts which he explored, but received specimens of it from the higher province of Minas Geraes.

Natterer, however, found it in several localities in the southern part of the province of São Paulo, which he traversed during his second and third journeys, and collected ten specimens. He describes it as seen sitting quietly in the middle of the lower branches of the trees at the edges of the forests, and capturing, as they fly by, insects, which it kills by beating them against the branches, after the manner of a Bee-eater (*Merops*). Natterer, as quoted by v. Pelzeln (*l. s. c.*), notes the old bird as having the bill black; the tongue very thin, small, and pointed, about one third of the length of the bill; the iris dark brown; and the feet blackish grey, with the hinder part of the tarsus passing into greyish green. The native name at Piahy, in São Paulo, on the river of the same name, was "Cuite-lucu."

Reinhardt, in his excellent memoir on the avifauna of the Campos of Brazil, drawn up on Lund's collections and notes, gives the vernacular name of this Jacamar at Lagoa Santa, in the

centre of Minas Geraes, as "Bicudo." He tells us it is very common in the underwoods of the province of Rio, as also in that part of Minas Geraes which lies east of the Serra do Espinhaçu. It is also found, though less abundantly, in the small woods on the Campos. In habits it does not differ from *Galbula viridis*, being usually seen sitting on a branch of a tree on the look-out for insects, and returning after their capture to the same, or to a nearly adjacent seat. According to Lund's hunters this species possesses a very agreeable song, composed of several abrupt whistling cadences. Burmeister, who met with it in the same districts as Lund, gives us a similar account of its habits. Hr. Carl Euler, who has contributed some interesting notes on the birds observed by him in the neighbourhood of Cantagallo, in the province of Rio, to the 'Journal für Ornithologie,' tells us that this Jacamar bores deep holes in the steep banks—no doubt for the purpose of nidification.

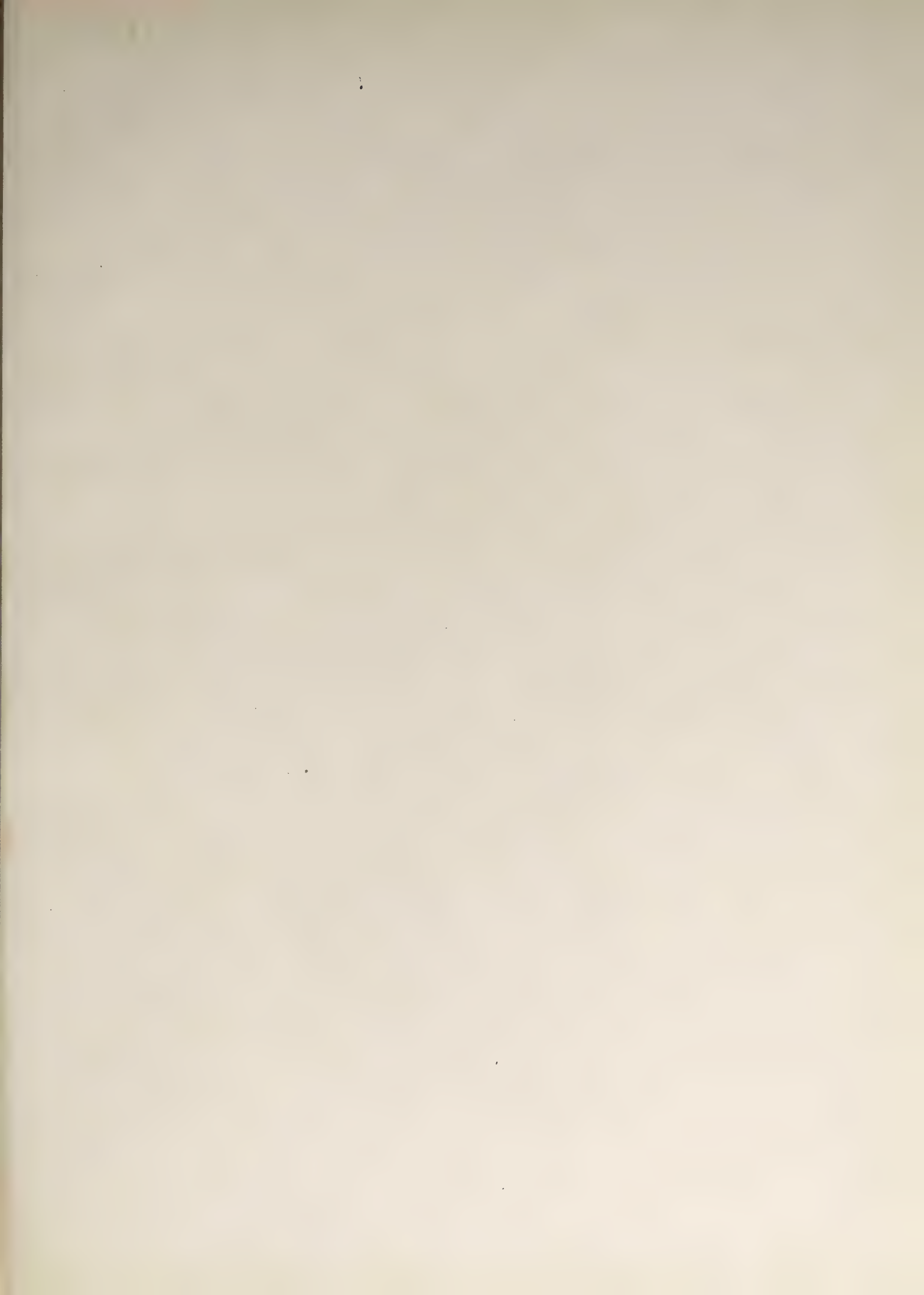
The general plumage of the Three-toed Jacamar above is of a dull black, glossed over with dark bluish green; the feathers on the top and sides of the head are striped mesially with ferruginous brown, they are slightly elongated, and are probably raised by the living bird, when excited, into a slight crest; below, the throat is black, the chin being slightly tinged with ferruginous, a long patch occupying the whole of the central portion of the breast and belly is of a pure white, the sides, flanks, and crissum being dark cinereous. The under surfaces of the wings and tail are of a dull black; but the inner margins of the wing-feathers towards their bases are white. In the dried skins the bill is black, as also the feet, except at the back of the tarsi and on the under surface of the toes, which are apparently reddish.

So far as I can tell, there is little external difference in the sexes of this Jacamar. Unfortunately I have no marked specimens available for comparison; but those which I consider as probably females have the throat paler, and the ferruginous stripes on the chin reaching further down.

The following table gives the dimensions of the examples of this Jacamar in my own collection and in that of Messrs. Salvin and Godman.

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♂?	P. L. S.	S ^{ta} Fé, Minas (<i>Rogers</i>).	7·5	2·8	2·8	1·9
2.	♀?	P. L. S.	S.E. Brazil.	7·7	2·9	2·8	1·9
3.	♂?	S.-G.	Novo Friborgo (<i>Youds</i>).	6·7	3·0	2·8	1·8
4.	♂?	S.-G.	Novo Friborgo (<i>Youds</i>).	6·8	2·8	2·7	1·6
5.	♀?	S.-G.	Vic. of Bahia (<i>Wucherer</i>).	7·2	2·9	2·7	1·7

The figure (Plate XVI.) is taken from No. 1.





Illustrated by J. A. Sclater

Hanhart imp.

CALPALCYRHYNCHUS LEUCOTIS, ♂ et ♀.

GALBALCYRHYNCHUS LEUCOTIS.

THE WHITE-EARED JACAMAR.

PLATE XVII.

- Galbalcyrrhynchus leucotis*, Des Murs, Rev. Zool. 1845, p. 207.
Jacamara leucotis, Des Murs, Icon. Orn. t. 17 (1849).
Galbalcyrrhynchus leucotis, Gray et Mitch. Gen. B. iii. App. p. 30a (1849).
Galbalcyrrhynchus leucotis, Bp. Consp. i. p. 153 (1850).
Caucias leucotis, Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 310 (1851).
Alcyonides leucotis, Reich. Handb. d. sp. Orn. p. 83 (1852).
Galbalcyrrhynchus leucotis, Scl. Syn. Galb. p. 10 (1852).
Galbalcyrrhynchus leucotis, Cassin, Cat. Halc. p. 19 (1852).
Galbalcyrrhynchus leucotis, Bp. Consp. Vol. Zyg. p. 14 (1854).
Galbalcyrrhynchus leucotis, Des Murs, Expéd. de Castelnau, Zool. Ois. p. 31 (1855).
Galbalcyrrhynchus leucotis, Scl. P. Z. S. 1855, pp. 16 et 137.
Galbalcyrrhynchus leucotis, Hartl. Journ. f. Orn. 1857, p. 43.
Galbalcyrrhynchus leucotis, Scl. Cat. A. B. p. 268 (1862).
Caucias leucotis, Cab. et Hein. Mus. Hein. iv. p. 228 (1863).
Galbalcyrrhynchus leucotis, Scl. et Salv. P. Z. S. 1866, p. 192.
Galbalcyrrhynchus leucotis, Scl. et Salv. P. Z. S. 1867, p. 978.
Galbalcyrrhynchus leucotis, Scl. et Salv. P. Z. S. 1873, p. 294.
Galbalcyrrhynchus leucotis, Scl. et Salv. Nomencl. p. 105 (1873).

Castaneus; pileo, alis et caudâ nigris æneo lavatis; illarum tectricibus dorso concoloribus; plagâ post-oculari albâ, mento nigricante; subalaribus castaneis; rostro et pedibus albis: long. tota 8·0, alæ 3·5, caudæ 2·2, rostri a rictu 2·1. *Fem.* mari similis, sed maculâ postoculari nullâ.

Hab. in Amazoniâ superiore.

THE Galbulidæ, as is explained in the Introduction to this work, may be naturally divided into two subfamilies, of one of which *Jacamerops* is the only known representative, while all the other Jacamars belong to the typical subfamily Galbulinæ. Of the several forms appertaining to the latter group the bird now before us is certainly the most abnormal. Its large heavy bill and short square tail give it a very different appearance from that of any other member of the subfamily, while at the same time it diverges widely from its relatives in the general character of its plumage.

The White-eared Jacamar was first made known to science by M. Desmurs, in an article published in the 'Revue Zoologique' for 1845, and placed in a separate genus of Galbulidæ

under the extraordinary name "*Galbalcyrhynchus*," by which, we presume, it was intended to indicate a Jacamar with the bill of a Kingfisher. Shortly afterwards the species was figured by the same author in his 'Iconographie Ornithologique,' and the name, to which, we may well suppose, some objections had, not unnaturally, been raised, was altered into "*Jacamaralcyonides*"! Of these two barbarisms I prefer the first, as not only prior in date, but also shorter by three syllables. The only question is whether we are not justified in following Dr. Cabanis's proposal to reject both of them in favour of his term *Cauecias*.

M. Des Murs gives the locality of his original specimens of this bird as Bogotá. It is quite possible that *Galbalcyrhynchus* may come occasionally within the grasp of the Bogotá bird-hunters, though I have never seen examples of it in the numerous series of birds' skins which I have examined from that locality. But the more recent explorers of the Upper Amazons and its tributaries have met with this singular form in considerable abundance, and have supplied our collections with excellent specimens. MM. Castelnau and Deville brought examples to Paris obtained during their descent of the Ucayali. Mr. Edward Bartlett met with it on the same stream in 1865 and the following years, and has kindly favoured me with the following notes on its habits:—"This Kingfisher-like bird I always found in the dense swampy forests on the borders of the rivers, sitting at the end of a dead broken bough of a tree, about ten or twelve feet from the ground, and watching for insects like the Kingfisher watches for fishes. They dart off after their prey, and either return to the same bough or to a similar position close by. Although I obtained this peculiar bird at Sarayacu, on the Upper Ucayali, and on the Lower Ucayali, and again at Yurimaguas, it was not common in any place. In fact I obtained but few specimens, although I saw many; but they were extremely shy and difficult to get at. I could not learn anything respecting its nests or eggs. The iris, the naked skin round the eye, and the legs are coral-red in life."

From the main stream of the Amazons we have likewise received many examples of this Jacamar of late years. Mr. Hauxwell has transmitted skins from Pebas, prepared with the usual care bestowed upon his collections; and Mr. H. Whitely obtained several specimens of it during his recent stay at Yquitos, higher up the river. This part of Upper Amazonia may therefore be pronounced to be the authentic patria of *Galbalcyrhynchus*.

The plumage of this species is generally of a nearly uniform dark maroon or chestnut-brown above and below. The wing- and tail-feathers are black, glossed externally, except on the apical halves of the primaries, with dark bronzy green. The feathers on the front and top of the head are constricted into narrow filaments, and are also of a black colour with a slight bronzy tinge; and the chin between the rami of the lower mandible is nearly black. The under wing-coverts and bend of the wing are of the same chestnut as the general plumage. The spaces round the eye and lores are naked, the lores being divided from the base of the bill by a narrow line of short bristly feathers, which project forwards. In the male a large white patch occupies the ear-coverts and sides of the head behind the eyes. This patch is absent in the female, in which these parts are of the same chestnut colour as the rest of the body. The bill and feet are white, the bill being more or less stained towards the base with earthy brown, and the claws hazel.

The spine at the carpal joint is strongly developed in this Jacamar, especially in the male bird.

The following list gives the dimensions of the examples of this Jacamar in my own collection and that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♂	P. L. S.	Pebas (<i>Hauxwell</i>).	8·0	3·5	2·2	2·1
2.	♀	P. L. S.	Ucayali (<i>Bartlett</i>).	7·6	3·2	2·4	1·9
3.	♂	S.-G.	Yquitos (<i>Whitely</i>).	7·2	3·3	2·0	2·1
4.	♂	S.-G.	Pebas (<i>Hauxw.</i>).	7·7	3·5	2·2	2·1
5.	♀	S.-G.	Ucayali (<i>Bartl.</i>).	7·7	3·4	2·4	2·2
6.	♂	P. L. S.	Elvira, E. Peru (<i>Hauxw.</i>).	7·8	3·5	2·2	2·2

The figures (Plate XVII.) are taken from Nos. 1 and 2.



W. G. Sclater del.

Hanhart imp.

JACAMEROPS GRANDIS, ♂ et ♀.

JACAMEROPS GRANDIS.

THE GREAT JACAMAR.

PLATE XVIII.

- Alcedo aurea*, P. L. S. Müller, Natursyst. Suppl. p. 94 (1776).
Great Jacamar, Lath. Syn. i. p. 605 (1782).
Galbula grandis, Gm. S. N. i. p. 458 (1788).
Galbula grandis, Lath. Ind. Orn. i. p. 245 (1790).
Le Jacammaciri, Aud. et Vieill. Ois. Dor. i. Jac. t. 6 (1802).
Jacamarici, Levaill. Ois. de Par. ii. t. 54, p. 125 (1806).
Galbula jacamaciri, Shaw, Nat. Misc. vol. xx. t. 833 (1819).
Great Jacamar, Latham, Gen. Hist. iv. p. 3 (1822).
Galbula grandis, Vieill. Enc. Méth. p. 1325 (1823).
Jacamerops grandis, Less. Traité d'Orn. p. 234 (1831).
Lamprotila platyryncha, Sw. Class. B. ii. p. 336 (1837).
Jacamerops grandis, Gray et Mitch. Gen. B. i. p. 84 (1847).
Lamproptila grandis, Cab. in Schomb. Guian. iii. p. 718 (1848).
Jacamerops grandis, Gray, List of Fiss. B. M. p. 68 (1848).
Jacamerops isidori, Deville, Rev. Zool. 1849, p. 55.
Jacamerops grandis, Bp. Consp. i. p. 153 (1850).
Lamproptila grandis, Cab. in Ersch u. Grub. Enc. sect. 1, lii. p. 310 (1851).
Jacamerops grandis, Reich. Handb. d. sp. Orn. p. 88, et
Jacamerops isidori, Reich. loc. cit. (1852).
Jacamerops grandis, Scl. Syn. Galb. p. 9, et
Jacamerops isidori, Scl. loc. cit. (1852).
Jacamerops grandis, Cassin, Cat. Halc. p. 18 (1852).
Jacamerops grandis, Bp. Consp. Vol. Zyg. p. 13, et
Jacamerops isidori, Bp. loc. cit. (1854).
Jacamerops grandis, Scl. P. Z. S. 1855, p. 16, et
Jacamerops isidori, Scl. loc. cit. (1855).
Jacamerops isidori, Des Murs, Expéd. de Castelnau, Zool. Ois. p. 32, t. x. (1855).
Jacamerops grandis, Pelz. Sitz. Ak. Wien, xx. p. 519 (1856).
Jacamerops grandis, Burm. Syst. Ueb. ii. p. 298 (1856).
Jacamerops grandis, Scl. P. Z. S. 1857, p. 263.
Jacamerops grandis, Scl. Cat. A. B. p. 268 (1862).
Jacamerops grandis, Lawr. Ann. Lyc. N. Y. vii. p. 291 (1862).
Lamproptila grandis, Cab. et Hein. Mus. Hein. iv. p. 227, et
Lamproptila isidori, Cab. et Hein. loc. cit. (1863).
SCL. Jac. & Puffb. No. VIII.—January, 1879.

Jacamerops grandis, Scl. et Salv. P. Z. S. 1864, p. 363.

Jacamerops grandis, Scl. et Salv. P. Z. S. 1867, p. 582.

Jacamerops grandis, Pelz. Orn. Bras. p. 25 (1871).

Jacamerops grandis, Scl. et Salv. P. Z. S. 1873, p. 294.

Jacamerops grandis, Scl. et Salv. Nomencl. p. 105 (1873).

Jacamerops grandis, Scl. et Salv. P. Z. S. 1879, p. 536.

Suprà nitidè metallico-viridis, præcipuè in interscapulio cupreo nitens; alis caudâque nigricantibus, extùs dorso concoloribus; subtùs castaneus, cervicis lateribus dorso concoloribus, gutturis plagâ medianâ albâ, mento nigricante; subalaribus et remigum marginibus interioribus castaneis; rostro nigro, pedibus fuscis: long. tota 10·8, alæ 4·5, caudæ 5·0, rostri a rictu 2·1. *Fem.* mari similis, sed maculâ gulari nullâ, et colore corporis subtùs dilutiore.

Hab. in Guiana totâ, Amazoniâ et Colombiâ usque ad isthmum Panamensem.

THERE can be no doubt, I think, that, as has been already pointed out, the most natural division of the Galbulidæ is into two groups, of one of which *Jacamerops* is the sole representative. This is not only indicated by the peculiar incurved and serrated bill and the different structure of the feet and tail, but is also further evidenced by the habits of the present species, which vary in some degree from those of the rest of the family.

Our knowledge of the existence of this larger form of Jacamar dates from the middle of the last century. In 1768 it was described and figured by Vosmaer, Director of the Cabinet of Nature and Art of the then Prince of Orange, in one of his tracts* devoted to the description of the rare objects of the Prince's collection. Vosmaer calls this bird a "long-tailed Kingfisher with two fingers turned forwards and two behind," and tells us that it was brought from the Dutch plantation of Berbice. There can, however, be no doubt, from Vosmaer's description and figure, that the bird in question was a male of the present species of Jacamar. In 1776, in his supplementary volume to his edition of Linnæus's 'Systema Naturæ,' P. L. S. Müller based his "*Alcedo aurea*" upon Vosmaer's bird.

Three years afterwards the Russian naturalist Pallas shortly indicated the existence of this species as one of three new species of *Galbula* with which he was acquainted, in a footnote to his article on *Alcedo tridactyla*, published in the sixth part of his 'Spicilegia Zoologica.' Pallas gave the bird no specific name; but Latham in 1782 based his "Great Jacamar" on Pallas's description; and Gmelin shortly afterwards latinized Latham's title into "*Galbula grandis*." Gmelin's specific name having met with universal adoption up to the present time, I am not willing to propose any change, although there can be no question that, according to the strict laws of priority, Müller's title should be allowed precedence.

At the beginning of the present century examples of this Jacamar appear to have been also

* 'Beschryving van een zeer fraaiën, zeldzaamen, of Misschien geheel onbekenden, Amerikaanschen Langstaartigen Ys-Vogel, aan den welken men twee voor- en twee agter-vingers ontmoet, herwaarts gebragt uit de Hollandsche Volkplanting de Berbice, en bewaard wordende in het Museum van zyne doorluchtigste hoogheid, den Heere Prinse von Orange en Nassauw, Erfstadhouder, Erf-gouverneur, Erf-Kapitein-Generaal en Admiraal der Vereenigde Nederlanden, enz. enz. Beschreeven en uitgegeeven door A. Vosmaer. Te Amsterdam.' By Pieter Meijer. 1768.

received in Paris, no doubt from the French colony of Cayenne. It thus followed that in 1802 Audebert and Vieillot were able to figure it in their 'Oiseaux Dorés' from an example in the Jardin des Plantes, and Levaillant shortly afterwards to give a representation of it in the second volume of his 'Oiseaux de Paradis.' In his 'General History of Birds,' published in 1822, Latham, besides repeating his former description, gave additional details respecting this species from examples which he had examined in the collections of Mr. Leadbeater and Lord Seaforth.

Lesson in 1831 first proposed to elevate the Great Jacamar to generic rank under the title "*Jacamerops*." This name, as having undoubted priority, I follow general practice in adopting, in preference to Swainson's term "*Lamproptila*" (erroneously written by the author "*Lamprotila*") published in 1837.

It has been already shown that the specimens of this bird known to the older authors were received from Surinam and Cayenne. In the neighbouring colony of British Guiana Schomburgk met with it generally distributed up to a height of 1600 feet above the sea-level. These birds are found solitary or in pairs, he tells us, and prefer the trees on the banks of the streams and the more open places in the forests. They are usually to be seen sitting sunk down on the branches waiting for insects, which they capture by flying out on them as they pass, quickly returning to their former position. Here they remain often for hours together in quiet solitude without stirring a feather. They are said to breed in holes in the banks, like *Galbula viridis*. The Macusis call them "Cuiaamia," the Warrans "Pohuorong."

In the interior of the northern part of South America *Jacamerops grandis* has a wide distribution, extending over the great Amazons valley, at least as far south as Borba on the Rio Madeira, and as far west as the Rio Napo. Natterer obtained examples of it at Borba, and again at Maratibanas, on the Rio Negro, and on the neighbouring Rio Icanna, which he explored in 1831. Natterer describes it as having the bill black, the eye-ring and lores blackish, the under eyelid olive-grey, the iris dark brown, and the feet olive-green with the soles dirty yellow, and the claws black.

Mr. Wallace met with *Jacamerops* on the Capim river, south of Pará, and again near Barra, at the mouth of the Rio Negro. He tells us that "this bird has more of the habits of the Trogons than of the true *Galbulæ*. While the latter are always found on the outskirts of the forest, the *Jacamerops* keeps rather to the gloom, where it sits on boughs hanging over the forest, and captures insects." Proceeding westward we find that examples of this species have been transmitted by Mr. Bates from the Rio Javari, by MM. Castelnau and Deville from Sarayaçu, on the Ucayali, and by Mr. E. Bartlett from Chamicuros and Santa Cruz in the same district. Mr. Bartlett, however, informs me that he did not find it by any means common. The Indians told him that these birds build in stumps of old trees, and in the banks of the smaller streams.

Mr. Buckley has lately forwarded skins of this Jacamar from the Rio Napo; and it also occasionally occurs in Bogotá collections, though not very commonly. But that *Jacamerops* extends over Colombia north of the Andes there can be no doubt, as Mr. Salmon obtained it at Remedios, in the State of Antioquia, and it is also found on the isthmus of Panamá. Mr. J. McLeannan procured many specimens when he collected on the Panamá railway; and there are

examples of it in the collection of Messrs. Salvin and Godman sent by Arcé from Chepo, near Panamá, and from Veragua.

Jacamerops appears to be what is called a monotypic form, consisting of only one species. In 1849 M. Deville described what he believed to be a second species of this genus from a specimen which he had procured at Pebas, on the Amazons, under the name *Jacamerops isidorei*; and the example was subsequently figured under the same title in the atlas of the voyage of Castelnau and Deville. I have on several occasions examined the type of this supposed species in the Paris Museum, and have come to the conclusion that it is merely a melanoid variety of *J. grandis*, the green of the back having passed into a dark purplish colour. In every other respect the so-called *J. isidorei* resembles *J. grandis*, which is likewise abundant in the same district.

Jacamerops grandis is so well-marked a form, and so different from all other members of the group, that a second lengthened description of it seems hardly necessary. But I give in the subjoined list the dimensions of the ten specimens in my collection and that of Messrs. Salvin and Godman.

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♀	P. L. S.	Barra (<i>Wallace</i>).	10·8	4·5	5·0	2·1
2.	♂	P. L. S.	S ^{ta} Cruz, Upp. Amaz. (<i>Bartlett</i>).	10·9	4·3	5·0	2·0
3.	♂	S.-G.	Napo, Ecuador (<i>Buckley</i>).	11·5	4·5	5·4	2·2
4.	♀	S.-G.	Napo, Ecuador (<i>Buckley</i>).	10·8	4·4	5·0	2·0
5.	♂	P. L. S.	Bogotá.	10·3	4·6	5·3	2·0
6.	♂	S.-G.	Remedios, Antioquia (<i>Salmon</i>).	11·8	4·4	5·4	2·1
7.	♂	S.-G.	Panamá (<i>McLeannan</i>).	11·0	4·4	5·3	2·0
8.	♀	S.-G.	Panamá (<i>McLeannan</i>).	11·0	4·2	5·1	1·11
9.	♂	S.-G.	Chepo, Panamá (<i>Arcé</i>).	10·5	4·2	5·5	2·0
10.	♀	S.-G.	Veragua (<i>Arcé</i>).	10·0	4·5	5·1	1·11

The figures (Plate XVIII.) are taken from Nos. 1 and 2.



EUGENIO COLLAPEZ

BUCCO COLLARIS.

THE COLLARED PUFF-BIRD.

PLATE XIX.

- Bucco*, Briss. Orn. iv. p. 92, t. vi. fig. 2 (1760).
Bucco capensis, Linn. S. N. i. p. 168 (1766).
Barbu à collier de Cayenne, Daub. Pl. Enl. 395.
Le Tamatia à collier, Buff. Hist. Nat. vii. p. 97 (1780).
Bucco capensis, Gm. S. N. i. p. 406 (1788).
Bucco collaris, Lath. Ind. Orn. i. p. 202 (1790).
Le Tamatia à collier, Levaill. Ois. de Par. ii. p. 97, t. 42 (1806).
Bucco collaris, Vieill. Nouv. Dict. iii. p. 240 (1816).
Collared Barbet, Lath. Gen. Hist. iii. p. 218 (1822).
Bucco collaris, Vieill. Enc. Méth. p. 1420 (1823).
Capito collaris, Wagl. Syst. Av. *Capito*, sp. 3 (1827).
Tamatia collaris, Less. Tr. d'Orn. p. 167 (1831).
Capito collaris, Tsch. Faun. Per. Aves, p. 259 (1845-46).
Bucco collaris, Gray et Mitch. Gen. B. i. p. 74 (1846).
Bucco collaris, Gray, List of Fiss. B. M. p. 47 (1848).
Tamatia collaris, Hahn et Kuster, Vögel aus Asien, Lief. iii t. 5 (1850).
Capito collaris, Bp. Consp. i. p. 146 (1850).
Bucco collaris, Scl. Ann. N. H. ser. 2, xiii. p. 356 (1854).
Bucco collaris, Scl. Syn. Bucc. p. 7 (1854).
Bucco collaris, Scl. P. Z. S. 1854, p. 110.
Capito collaris, Bp. Consp. Vol. Zyg. p. 13 (1854).
Bucco collaris, Scl. P. Z. S. 1855, p. 196.
Bucco collaris, Pelz. Sitz. Ak. Wien, xx. p. 510 (1856).
Capito collaris, Burm. Syst. Ueb. ii. p. 287 (1856).
Bucco collaris, Scl. Cat. A. B. p. 268 (1862).
Bucco collaris, Cab. et Hein. Mus. Hein. iv. p. 148 (1863).
Bucco collaris, Scl. et Salv. P. Z. S. 1867, p. 582.
Bucco collaris, Scl. et Salv. P. Z. S. 1867, p. 751.
Bucco collaris, Pelz. Orn. Bras. p. 22 (1871).
Bucco collaris, Scl. et Salv. P. Z. S. 1873, p. 294.
Bucco collaris, Scl. et Salv. Nomencl. p. 105 (1873).

Suprà lætè ferrugineus, lineis nigris nisi in capitis lateribus transfasciatus; vittâ dorsali nigrâ; subtùs albus, vittâ pectorali nigrâ, abdomine ochraceo lavato, hypochondriis et subalaribus fulvis; alis nigris,
SCL. Jac. & Puffb. No. IX.—*May*, 1880.

remigibus secundariis externis et caudâ dorso concoloribus; rostro rubro, culmine nigricante; pedibus flavidis: long. tota 7·0, alæ 3·2, caudæ 2·6, rostri a rictu 1·4.

Hab. in Guianâ et Amazoniâ totâ.

ALTHOUGH Brisson, to whose exact descriptions the greater number of the species of birds contained in the last edition of the 'Systema Naturæ' were referred, attributed several species to his genus *Bucco*, Linnæus adopted but one of these—namely, the bird denominated by Brisson "*Bucco*" par excellence, to which Linnæus added, by some curious oversight, the specific term "*capensis*," although Brisson gave its correct habitat. It follows, therefore, that *Bucco capensis* (that is, the present bird), however far we subdivide the group to which it belongs, must remain the typical species of the genus *Bucco* of Linnæus, and of the whole family Bucconidæ.

Gmelin, in his edition of the 'Systema Naturæ' (published in 1788), continued the use of the erroneous Linnæan name "*capensis*," although he correctly states Guiana as the locality of the species. But two years subsequently Latham changed the specific term to "*collaris*," which has since been universally adopted as the designation of this bird.

The older authors were only acquainted with this Puff-bird as a denizen of the forests of Cayenne and Demerara. In the large collections that were, until recently, sent to Paris from the former colony *Bucco collaris* was not an unfrequent species. Schomburgk does not include it in his list of the birds of British Guiana; but there can be little doubt that it occurs also in that colony in suitable localities. From the littoral countries of this part of South America the present species extends far into the interior throughout the dense forests of Amazonia. Natterer met with it on the Rio Negro at Marabitanas and below Boavista, also near Borba on the Rio Madeira. In his field-notes, as given by Pelzeln (Sitz. Ak. Wien, xx. p. 510), he describes the bill in fresh specimens of the female sex as "dark orange-red, with the point of the upper mandible black, and the culmen reddish grey. The tongue is small and cartilaginous, with the apex entire, and reaches rather beyond the middle of the length of the beak. The eye-ring is very broad, thin-skinned, orange yellow in colour, the inner half black. The naked region round the eye is pale brownish-yellow, somewhat passing into green. The iris is bright vermilion, with an outer ring of dirty whitish yellow, which ring is much broader under the upper eyelid, where it occupies nearly half the iris. The feet are yellowish green, and the claws pale ochre-yellow." In the male, Natterer tells us that the colours of the soft parts are as in the female, except that the "culmen and apex of the upper mandible are dark brown, the feet and claws are dirty yellow, with the upper surface of the tarsi scarcely passing into olive." The bird was found by Natterer solitary in the forests. Mr. Wallace also obtained this species on the Rio Negro.

From the forests of Upper Amazonia many well-known collectors have transmitted examples of *Bucco collaris*. Hauxwell's excellent skins of this species are marked "Chamicurros" and "Loreto-yacu." Mr. E. Bartlett met with it at the former place, and also at Chyavetas. He remarks that it is found more in the hilly and dry districts, and is often "seen near the ground, hunting for beetles and other insects." Whitely's collection from Yquitos, made in 1878, contained examples of this species, as did Poeppig's series from the province of Maynas, now in the Leipsic Museum. Still further to the west, it has been obtained by Mr. Buckley at Sarayacu in Eastern Ecuador, an Indian village situated on the Bobanaza—a confluent of the Pastaza, which

must be carefully distinguished from the better-known place of the same name on the Ucayali. It has also been transmitted from the Rio Napo (see P. Z. S. 1854, p. 110). Tschudi, in his 'Fauna Peruana,' mentions its occurrence in Eastern Peru without giving any details as to the exact locality in which he found it.

Except as regards the slight deviation in the colours of the soft parts mentioned by Natterer, there would seem to be no external difference in the sexes of this *Bucco*. Above, the general plumage is of a bright ferruginous brown, regularly banded across, except on the sides of the head, with narrow black bars. This colour embraces the secondaries and the tail-feathers, in which, however, the bars are further apart. A broad black collar crosses the upper back, and is continued below across the chest. The throat is pure white, the abdomen pale fulvous, which grows darker on the flanks and the under tail-coverts. The remiges are greyish black, margined at the base of their inner webs with pale fulvous like the under wing-coverts. The bill, in the dried skin, is orange-red, with the apex and culmen passing into dark horn-colour; the feet are brown.

There is no other species of *Bucco* that at all resembles the present species in colour.

The specimens of *Bucco collaris* in my collection and that of Messrs. Salvin and Godman, and their dimensions, are as follows:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	inc.	P. L. S.	Cayenne.	6·7	3·1	2·4	1·4
2.	♀	S.-G.	Marabitanas, Rio Negro (<i>Natterer</i>).	7·0	3·2	2·6	1·4
3.	♀	S.-G.	Chyavetas, E. Peru (<i>Bartlett</i>).	7·5	3·5	2·6	1·6
4.	♀	P. L. S.	Yquitos E. Peru (<i>Whitely</i>).	6·8	3·3	2·6	1·4
5.	♀	P. L. S.	Loreto-yacu, E. Peru (<i>Hauxwell</i>).	7·0	3·2	2·3	1·4
6.	inc.	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	6·5	3·1	2·2	1·4

The figure (Plate XIX.) is taken from No. 4.



Col. Bennett del.

Henhart imp.

BUCCO MACRORHYNCHUS

BUCCO MACRORHYNCHUS.

THE GREATER PIED PUFF-BIRD.

PLATE XX.

- Barbu à gros bec de Cayenne*, Daub. Pl. Enl. 689.
Le plus grand Tamatia noir et blanc, Buff. Hist. Nat. vii. p. 99 (1780).
Greater Pied Barbet, Lath. Syn. i. p. 498 (1782).
Bucco macrorhynchus, Gm. S. N. i. p. 406 (1788).
Bucco macrorhynchus, Lath. Ind. Orn. i. p. 203 (1790).
Tamatia à plastron noir, Levaill. Ois. de Par. ii. p. 92, t. 39 (1806).
Bucco macrorhynchus, Vieill. Nouv. Dict. iii. p. 240 (1816).
Greater Pied Barbet, Lath. Gen. Hist. iii. p. 220 (1822).
Bucco macrorhynchus, Vieill. Enc. Méth. p. 1420 (1823).
Capito macrorhynchus, Wagler, Syst. Av. *Capito*, no. 1 (1827).
Tamatia macrorhynchus, Less. Tr. d'Orn. p. 167 (1831).
Cyphos macrorhynchus, Strickl. Ann. Nat. Hist. vi. p. 418 (1841).
Bucco macrorhynchus, Gray et Mitch. Gen. B. p. 74 (1846).
Bucco macrorhynchus, Cab. in Schomb. Guian. iii. p. 719 (1848).
Bucco macrorhynchus, Gray, List of Fiss. B. M. p. 47 (1848).
Capito macrorhynchus, Bp. Consp. i. p. 146 (1850).
Tamatia macrorhynchus, Bp. Consp. Vol. Zyg. p. 13 (1854).
Bucco macrorhynchus, ScL. Ann. N. H. ser. 2, xiii. p. 357 (1854).
Bucco macrorhynchus, ScL. Syn. Bucc. p. 7 (1854).
Bucco macrorhynchus, ScL. P. Z. S. 1855, p. 196.
Bucco macrorhynchus, Pelz. Sitz. Ak. Wien, xx. p. 511 (1856).
Bucco macrorhynchus, ScL. Cat. A. B. p. 269 (1862).
Notharchus macrorhynchus, Cab. et Hein. Mus. Hein. iv. p. 151 (1863).
Bucco macrorhynchus, Pelz. Orn. Bras. p. 21 (1871).
Bucco macrorhynchus, ScL. et Salv. Nomencl. p. 105 (1873).

Suprà niger; fronte angustâ et torque colli postici necnon plumarum dorsi et scapularium marginibus tenuissimis albis; subtùs albus, torque subpectoralis lato et subalaribus nigris, hypochondriis albo nigroque transfasciatis, ventre fulvo vix tincto; remigum rectricumque paginâ inferiore cineraceâ, illorum pogoniis internis basin versùs albis; rostro nigro; pedibus fuscis: long. tota 8·5, alæ 4·1, caudæ 3·0, rostri a rictu 1·7.

Hab. in Guianâ, Cayennâ et in ripis fl. Nigri.

IN contrast to the single isolated form represented on the last Plate, we now come to a group of three nearly allied species distributed over a wide area, of which each occupies a distinct portion.

Bucco macrorhynchus of the Guianas is represented in South-eastern Brazil by *Bucco swainsoni*, and in Central America, Columbia, and Upper Amazonia by *B. dysoni*, all, no doubt, not very remote descendants from one common stock, but presenting at the present epoch sufficient differences for specific separation.

As in most such cases, the Guianan form of this little group was the first that became known to science—having been described by Buffon in 1780, from examples received in Paris from the French colony of Cayenne, and figured in the ‘Planches Enluminées.’ Gmelin’s *Bucco macrorhynchus* was based on Buffon’s description and figures; and his name has happily remained without alteration, except as regards its generic term, to the present day.

In British Guiana, Schomburgk tells us, *Bucco macrorhynchus* is a rare bird. Schomburgk only met with a few individuals on the Canaku Mountains, and could get no information concerning the habits of the species.

From the Guianas this Puff-bird extends into the interior, and is met with on the banks of the Rio Negro. Here, however, it would likewise appear to be of rare occurrence, as Natterer, during his ascent of the Rio Negro in 1830 and the following years, only obtained two examples of it, one near Barra, and a second on the Rio Brancho, and gives us no details whatever of its habits. Mr. Wallace, during his expedition up the same river in 1850–51, does not seem to have met with it at all.

In Upper Amazonia this species is replaced by the nearly allied *Bucco dysoni* (sive *Bucco napensis*), which, from Mr. Wallace’s observations (P. Z. S. 1857, p. 582), appears to extend along the south bank of the main stream to the district just above Barra.

I have, unfortunately, before me no specimens of *Bucco macrorhynchus* (which is rather a rare species in collections) with the sexes ascertained; but there can be little doubt that the male and female are exactly alike externally. The example from which the figure has been prepared, and which is an old skin of the well-known “Cayenne” make, purchased in Paris in 1854, may be shortly described as follows:—Above, the plumage is of a dull black, rather deeper in colour on the head, the feathers on the back and scapularies being very finely edged with white; a narrow front and a concealed collar at the back of the neck are white. Below, the whole throat and upper breast are white, succeeded by a broad black band which crosses the upper part of the belly. The middle of the lower belly is slightly tinged with pale fulvous, whilst the flanks are barred with narrow black and white cross bands. The under wing-coverts are black; but the inner webs of the wing-feathers, on their lower surface, are white in the basal half, the apical half being, like the under surface of the tail-feathers, of a uniform cinereous. The bill in the dried skins is black; the feet are brown, with the claws dark.

The two examples of *Bucco macrorhynchus* in my collection measure as follows:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	inc.	P. L. S.	Cayenne.	8·5	4·1	3·0	1·7
2.	inc.	P. L. S.	British Guiana.	9·8	4·2	3·1	1·8

The figure (Plate XX.) is taken from No. 1.



BUCCO DYSONI.

DYSON'S PUFF-BIRD.

PLATE XXI.

Capito macrorhynchus, Tsch. F. P. Aves, p. 249 (1845).

Bucco macrorhynchus, Scl. P. Z. S. 1854, p. 110.

Tamatia gigas, Bp. Consp. Vol. Zyg. p. 13 (1854).

Bucco dysoni, Scl. P. Z. S. 1855, p. 193.

Bucco leucocrissus, Scl. P. Z. S. 1860, p. 284.

Bucco dysoni, Scl. et Salv. Ibis, 1860, p. 40.

Bucco dysoni, Lawr. Ann. L. N. Y. vii. p. 318 (1861).

Bucco dysoni, Scl. Cat. A. B. p. 269, et

Bucco leucocrissus, Scl. ibid., et

Bucco napensis, Scl. ibid. (1862).

Notharchus dysoni, Cab. et Hein. Mus. Hein. iv. p. 149, et

Notharchus albicrissus, Cab. et Hein. tom. cit. p. 151, et

Notharchus napensis, Cab. et Hein. tom. cit. p. 152 (1863).

Bucco dysoni, Scl. et Salv. P. Z. S. 1864, p. 363.

Bucco dysoni, Scl. P. Z. S. 1870, p. 201.

Bucco dysoni, Salv. Ibis, 1872, p. 322.

Bucco dysoni, Scl. et Salv. Nomencl. p. 105 (1873).

Suprà niger, fronte latâ supra oculos extensâ et torque colli postici necnon plumarum dorsi et scapularium marginibus angustissimis albis; subtus albus, torque subpectoralis lato et subalaribus nigris, hypochondriis albo et nigro transfasciatis; remigum rectricumque paginâ inferiore cineraceâ, illorum pogoniis internis basin versùs albis; rostro nigro, pedibus fuscis: long. tota 9·5, alæ 4·7, caudæ 3·5, rostri a rictu 0·8.

Hab. in Americâ centrali, Columbiâ, Æquatoriâ, et Amazoniâ superiore.

Obs. *B. macrorhyncho* maximè affinis, sed fronte latiore albâ et ventre non fulvo tincto distinguendus.

THE species that replaces *Bucco macrorhynchus* of the Guianas in Upper Amazonia, and extends thence through Ecuador and Colombia into Central America, is slightly variable, and has received from me three different names, based upon specimens from three different localities. These three local forms I think it better, after having had the advantage of a considerable series for comparison, to unite as one species, which, although coming very near the Guianan bird, may, I think, always be distinguished by the characters above pointed out.

In 1855 I first published a description of this bird in an article, read before the Zoological Society, upon some members of the group additional to those contained in my Synopsis of the

previous year. As is there stated, there are good reasons for supposing that Prince Bonaparte's term "*gigas*" had been already bestowed upon an individual of this same species brought from Nicaragua by Delattre. But as no description of Bonaparte's "*Tamatia gigas*" had been published, and as the type had disappeared, it was not advisable to adopt his name, and I consequently employed for the species the MS. term "*dysoni*," which Mr. G. R. Gray had attached to a specimen in the British Museum. The late Mr. David Dyson, in whose honour the name was given, was a collector who proceeded to British Honduras in 1845, principally, I believe, with the object of procuring living examples of the Ocellated Turkey for the celebrated menagerie of the then Earl of Derby. There are many of his specimens in the British Museum and in the Derby Museum at Liverpool.

In 1860, in one of my papers upon Mr. Fraser's collection from Western Ecuador, I constituted the form of this bird which occurs in that district as a different species under the name *Bucco leucocrissus*. I was not aware at that time of the close relationship of the avifauna of the littoral of Western Ecuador to that of Central America, nor of the fact that many species extend from the Gulf of Guayaquil along the western coast far northward into the Central-American isthmus.

In 1862, in a footnote to my 'Catalogue of American Birds,' I further separated the form of this Puff-bird which occurs in Eastern Ecuador, as *Bucco napensis*, founding this species on examples in my own possession received through Mr. Gould from the river Napo, which in my article on that collection, published in 1854, I had not distinguished from *Bucco macrorhynchus*.

When Mr. Salvin and I were preparing our article upon M'Leannan's Panama collection, we had occasion to determine to which of the three above-mentioned forms the bird that occurs on the isthmus should be referred. We came to the conclusion that it could not be distinguished from the typical *B. dysoni* of Honduras and Guatemala, and that *B. leucocrissus* of Western Ecuador could hardly be kept separate. Having now the series of fourteen specimens before me, and having recently examined many others, I am quite disposed to back this opinion.

The exact amount of white on the forehead, and the breadth of the black band below, are both variable features in examples from the same district, although, as a general rule, the white front is narrower and the black breast-band is broader in northern examples. On the whole, however, I am convinced that the only satisfactory mode of dealing with the question is to refer all the forms to one species, for which the name *Bucco dysoni*, as first in point of date, should be adopted.

The occurrence of *Bucco dysoni* on the south bank of the Amazons, above Barra, as noted in my remarks on the preceding species, is certainly rather singular. Unfortunately I have no longer access to the specimen upon which the observation was made; but I do not think that there was any mistake in the matter.

My friends Godman and Salvin tell me that, during their expedition to Guatemala in 1862, they met with *Bucco dysoni* in the forests near Escuintla, a village situated on the Pacific slope at an altitude of about 2000 feet above the sea-level. The bird was usually observed solitary or in pairs perched on withered branches at the summit of the highest trees, and almost out of gunshot. On being fired at unsuccessfully it would merely turn its head slightly and resume its former position; so that several successive shots were sometimes fired before it was disturbed

from its perch. They also obtained examples of this Puff-bird in the forest-region north of Coban in the province of Vera Paz, where it was found in similar situations.

I add a list of the specimens of this species in my own collection and that of Messrs. Salvin and Godman, and a table of their principal dimensions.

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	inc.	P. L. S.	Vera Paz (<i>Constancia</i>).	9·5	4·7	3·5	1·8
2.	♂	S.-G.	Escuintla, Guatemala (<i>S. & G.</i>).	10·2	4·6	3·6	1·9
3.	♀	S.-G.	Escuintla, Guatemala (<i>S. & G.</i>).	10·2	4·6	3·7	1·8
4.	inc.	S.-G.	Chontales (<i>Belt</i>).	9·3	4·4	3·4	1·8
5.	♂	S.-G.	Chiriqui (<i>Arcé</i>).	10·0	4·3	3·5	1·8
6.	♂	S.-G.	Bugaba, Chiriqui (<i>Arcé</i>).	9·1	4·5	3·5	1·9
7.	♂	S.-G.	Panama (<i>M^cLeannan</i>).	9·0	4·5	3·5	1·8
8.	inc.	P. L. S.	Panama.	9·0	4·4	3·4	1·8
9.	inc.	P. L. S.	Bogota.	8·5	4·5	3·6	1·9
10.	inc.	S.-G.	Bogota.	8·2	4·3	3·2	1·7
11.	inc.	P. L. S.	Rio Napo.	9·0	4·4	3·4	1·7
12.	inc.	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	9·0	4·4	3·5	1·7
13.	inc.	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	9·0	4·4	3·2	1·8
14.	♂	P. L. S.	Babahoyo, Ecuador (<i>Fraser</i>).	10·0	4·5	3·5	1·9
15.	♀	P. L. S.	Babahoyo, Ecuador (<i>Fraser</i>).	10·0	4·4	3·3	1·9

The figure (Plate XXI.) is taken from No. 1; No. 11 is the type of my *Bucco napensis*; and Nos. 14 and 15 are the types of my *Bucco leucocrissus*.



H. H. Sclater imp

LYNCE HYPERHYNCHUS

BUCCO HYPERRHYNCHUS.

THE GIANT PUFF-BIRD.

PLATE XXII.

Bucco macrorhynchus, Scl. Ann. Nat. Hist. ser. 2, xiii. p. 357 (1854).

Bucco macrorhynchus, Scl. Syn. Bucc. p. 7 (1854).

Tamatia hyperrhynchus, Bp. Consp. Vol. Zyg. p. 13 (1854).

Bucco hyperrhynchus, Scl. P. Z. S. 1855, p. 193, pl. cv.

Bucco (Capito) giganteus, Pelz. Sitz. Ak. Wien, xx. p. 511 (1856).

Bucco hyperrhynchus, Scl. P. Z. S. 1858, p. 60.

Bucco hyperrhynchus, Scl. Cat. A. B. p. 269 (1862).

Notharchus hyperrhynchus, Cab. et Hein. Mus. Hein. iv. p. 150 (1863).

Bucco hyperrhynchus, Scl. et Salv. P. Z. S. 1867, p. 582.

Bucco giganteus, Pelz. Orn. Bras. p. 20 (1871).

Bucco hyperrhynchus, Scl. et Salv. Nomencl. p. 105 (1873).

Bucco hyperrhynchus, Scl. et Salv. P. Z. S. 1873, p. 295.

Bucco hyperrhynchus, Layard, Ibis, 1873, p. 391.

Suprà niger, fronte latâ ad oculos extensâ necnon plumarum dorsi et scapularium marginibus tenuissimis albis; subtùs albus, torque subpectoralî lato et subalaribus nigris, hypochondriis albo nigroque variegatis; remigum et rectricum paginâ inferiore cineraceâ, illorum pogoniis internis basin versùs albis; rostro valido, producto, nigro; pedibus obscurè fuscis: long. tota 10·2, alæ 4·5, caudæ 3·3, rostri 2·2.

Hab. in Amazoniâ inferiore et superiore.

Obs. Species a *B. macrorhyncho* fronte albâ usque ad oculos extensâ, necnon rostro valdè majore distinguenda.

THE famous Austrian naturalist Johann Natterer, whose name I have so often mentioned in this work, was the discoverer of this fine species, although (owing to his untimely death and to the consequent delay in the publication of his discoveries) it does not bear the name which he gave to it in his MS. journal. Natterer obtained altogether twelve examples of this bird during his journeys up the Rio Negro and in the vicinity of Pará in 1831 and the succeeding years, and designated it "*giganteus*," remarking that it differs from *B. macrorhynchus* in its larger size, its much longer and thicker beak, and the extension of the white forehead over the anterior part of the head. Natterer, as quoted by von Pelzeln, states that in the fresh bird the "bill is black, as likewise the eye-ring and naked space round the eye; the iris carmine-red, darker on the outer half; the feet very dark bluish-grey, toes blackish, and claws black." Natterer procured his examples at Fort San José de Marabitanas, on the Upper Rio Negro, on the Rio Curicuriari (a small confluent of the last-named river), and at two localities near Pará.

In the last-named locality two other well-known naturalists have likewise obtained examples

of this *Bucco*. Mr. Wallace met with it in the forests near Pará during his sojourn in that city in 1848. Mr. Layard, when consul at Pará, procured three specimens of it in the same district in 1873, one of which is now in my collection. In his article "on the Birds observed at Pará," published in 'The Ibis' for 1873, Mr. Layard gives us the subjoined interesting notes on this species:—

"I watched this powerful bird for some time before I shot it, on the 4th of January, 1873. It was hopping about the thick branches of a large tree, and in all its actions reminded me of a 'Kinghunter' (*Halcyon*). In its stomach I found a large green *Cetonia*, just crushed and swallowed whole. I subsequently obtained two more, and was struck with their extreme stupidity.

"Three birds were in company on a very high tree. I had only my little collecting-gun, with a quarter of a dram of powder and dust-shot, but, selecting the lowest, fired at him. He swung round on his twig and hung suspended. I loaded quickly and aimed at the next, who never moved; at the first report he fell dead, and the third remained. I fired again, without effect; but the next shot brought it down. On firing again at the clinging bird it dropt into a lower tree, and lodged where I could not get it."

It seems evident, therefore, that Lower Amazonia, as it is generally termed (that is, the eastern portion of the great valley of the Amazons and Rio Negro), is the true home of this species. When Mr. Salvin and I wrote our article upon Mr. Wallace's collections in this district, we were inclined to regard *Bucco hyperrhynchus* as one of the forms peculiar to the vicinity of Pará, and stated our opinion that the locality "Upper Amazons" commonly attributed to it was erroneous. Such, however, would not appear to be the case; for that this *Bucco* intrudes into Upper Amazonia appears certain from the fact that Mr. Edward Bartlett obtained a specimen of it at Chamicuros, on the Huallaga, in 1867. A skin in my own collection, prepared by Mr. Hauxwell, is probably from the same district; but the exact locality is not attached to it.

The examples in the French national collection which Prince Bonaparte designated "*Tamatia hyperrhynchus*," and which I subsequently described under his MS. name, are likewise said to be from the Upper Amazons.

The existence of this species in the Rio Negro district, where *B. macrorhynchus* is found, and in Upper Amazonia, where *B. dysoni* likewise occurs, is certainly a curious fact in distribution, as such closely allied representative species usually occupy distinct areas. Herr v. Pelzeln (Sitz. Ak. Wien, xx. p. 498) is inclined to think that *B. giganteus* may be only the adult male of *B. macrorhynchus*, and speaks of having seen intermediate forms. I think if this had been the case we should have met with examples of *B. macrorhynchus* in collections from Cayenne, where, however, so far as I know, it has never occurred. Nor have I ever seen any specimens of the present bird that could not be readily distinguished from *B. macrorhynchus*.

The examples of this species in my collection measure as follows:—

No.	Sex.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	inc.	E. Peru (<i>Hauxwell</i>).	10·2	4·5	3·3	2·2
2.	♀	Pará (<i>Layard</i>).	10·0	4·3	3·6	2·1

The figure (Plate XXII.) was prepared from No. 1.



BUCCO SWAINSONI

BUCCO SWAINSONI.

SWAINSON'S PUFF-BIRD.

PLATE XXIII.

Tamatia macrorhynchos, Swains. Zool. Ill. ser. i. ii. pl. 99 (1822).

Bucco swainsoni, Gray et Mitch. Gen. B. i. p. 74 (1846).

Bucco swainsoni, Gray, List of Fiss. B. M. p. 47 (1848).

Capito swainsoni, Bp. Consp. i. p. 146 (1850).

Bucco swainsoni, Sclater, Ann. N. H. ser. 2, xiii. p. 358 (1854).

Bucco swainsoni, Scl. Syn. Bucc. p. 8 (1854).

Tamatia swainsoni, Bp. Consp. Vol. Zyg. p. 13 (1854).

Bucco swainsoni, Sclater, P. Z. S. 1855, p. 196.

Capito macrorhynchus, Burm. Syst. Ueb. ii. p. 283 (1856).

Bucco swainsoni, Pelz. Sitz. Ak. Wien, xx. p. 509 (1856).

Bucco swainsonii, Scl. Cat. A. B. p. 269 (1862).

Notharchus swainsoni, Cab. et Hein. Mus. Hein. iv. p. 151 (1863).

Bucco swainsoni, Pelz. Orn. Bras. p. 21 (1871).

Bucco swainsoni, Scl. et Salv. Nomencl. p. 105 (1873).

Notharchus swainsoni, Cab. J. f. O. 1874, p. 227.

Suprà niger, fronte angustissimâ et torque colli postici albis; subtùs albus, torque subpectoralis nigro, ventre fulvo, lateribus nigro transfasciatis; remigum et rectricum paginâ inferiore cineraceâ, illorum pogoniis internis basin versùs albis; rostro nigro; pedibus fuscis, unguibus nigris: long. tota 8·8, alæ 4·0, caudæ 3·2, rostri 1·5.

Hab. in Brasiliæ meridionali-orientalis regione sylvaticâ.

Obs. Sp. a *B. macrorhyncho* fronte multò angustiore albâ et ventre fulvo diversa.

IN the case of birds spread over a large area in South America, especially as regards those that pass their lives in the dense forests, the forms that tenant the wood-region of South-eastern Brazil are in most cases easily distinguishable. This has arisen, no doubt, from the fact that the Brazilian forest-region is cut off from that of the great valley of the Amazons by a range of open plains or "campos," which form nearly as effectual a barrier to the intercommunication of forest-loving species as a similar area of sea. We have a good example of this phenomenon in the present Puff-bird, which, although strictly a representative species of the same group as the three others which have preceded it, is obviously distinct, and recognizable at first sight by well-marked characters.

Swainson's Puff-bird was first made known to us by the well-known zoologist whose name it bears, by a figure and description contained in the first series of his 'Zoological Illustrations.' Mr. Swainson was disposed to regard his bird "from Southern Brazil, where the species is not

uncommon," as "only a variety of the *Greater Pied Barbet* of Dr. Latham," and gives us the following account of its habits, derived, no doubt, from his personal observations when he visited South-eastern Brazil in 1816-1818*.

"There is something very grotesque in the appearance of all the Puff-birds; and their habits, in a state of nature, are no less singular. They frequent open cultivated spots near habitations, always perching on the withered branches of a low tree, where they will sit nearly motionless for hours, unless, indeed, they descry some luckless insect passing near them, at which they immediately dart, returning again to the identical twig they have just left, and which they will sometimes frequent for months. At such times the disproportionate size of the head is rendered more conspicuous by the bird raising his feathers so as to appear not unlike a puff-ball; hence the general name they have received from the English residents in Brazil, of which vast country all the species, I believe, are natives. When frightened, their form is suddenly changed by the feathers lying quite flat. They are very confiding, and will often take their station within a few yards of the window; the two sexes are generally near each other, and often on the same tree."

Although, as I have shown above, this species is readily distinguishable from the true *Bucco macrorhynchus*, it remained unnamed until 1846, when Mr. G. R. Gray, in the 'Genera of Birds,' proposed to call it after its discoverer.

Besides Swainson's notes we have but few records of the observations of naturalists on this Puff-bird. Prince Maximilian does not appear to have met with it at all in the parts of Brazil which he traversed. Although two skins are before us labelled as obtained by Youds at Novo Fribourgo, in the province of Rio, Burmeister tells us that he did not meet with it in that district, but believes it to occur in the dense forests north of the Rio Parahyba, which he did not visit personally. But it was met with by Euler in the environs of Cantagallo, in the province of Rio, and further south, in the province of San Paulo, the indefatigable Natterer obtained specimens near Ypanema. According to his notes, as published by Herr v. Pelzeln, the "bill is black; the tongue long, cartilaginous, thin, flat, of equal breadth throughout, rather pointed at the end, and black in colour; the naked skin round the eye is blackish grey; iris dark brown in one specimen, in another carmine-red; the feet dark grey, with the edges of the scales white, and the claws black." The bird was observed sitting on the topmost branches of dead trees. Hr. v. Pelzeln refers some examples collected by Natterer on the Rio Negro also to this species; but it is much more probable that they are referable to the true *B. macrorhynchus*, which was obtained by Natterer in the same locality.

There would appear to be no external difference between the male and female of this species.

The skins of this Puff-bird in my own collection and that of Messrs. Salvin and Godman measure as follows:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	inc.	P. L. S.	S.E. Brazil.	8·8	4·0	3·2	1·5
2.	inc.	S.-G.	Novo Fribourgo (<i>Youds</i>).	8·7	4·2	3·4	1·6
3.	inc.	S.-G.	Novo Fribourgo (<i>Youds</i>).	8·6	4·1	3·4	1·6

The figure (Plate XXIII.) is taken from the specimen in my own collection.

* See, for a sketch of his journey, Edinburgh Phil. Journ. i. p. 369.



Hanhart imp

W. C. PETERSON

BUCCO PECTORALIS.

THE WIDE-BANDED PUFF-BIRD.

PLATE XXIV.

Bucco pectoralis, Gray et Mitch. Gen. B. p. 74, pl. xxvi. (1846).

Bucco pectoralis, Gray, List of Fiss. B. M. p. 47 (1848).

Capito pectoralis, Bp. Consp. i. p. 146 (1850).

Bucco pectoralis, Scl. Ann. N. H. ser. 2, xiii. p. 358 (1854).

Bucco pectoralis, Scl. Syn. Bucc. p. 8 (1854).

Tamatia pectoralis, Bp. Consp. Vol. Zyg. p. 13 (1854).

Bucco pectoralis, Scl. P. Z. S. 1855, p. 196.

Bucco pectoralis, Lawr. Ann. Lyc. N. Y. vii. p. 464 (1862).

Bucco pectoralis, Scl. et Salv. P. Z. S. 1864, p. 363.

Bucco pectoralis, Wyatt, Ibis, 1871, p. 374.

Bucco pectoralis, Scl. et Salv. Nomencl. p. 105 (1873).

Bucco pectoralis, Scl. et Salv. P. Z. S. 1879, p. 536.

Suprà niger, vix æneo nitens; dorsi postici et tectricum secundariorumque pogoniis angustissimè albo marginatis; spatio utrinque postoculari cum torque colli postici angusto intercedente albis; subtùs gulâ circumscriptâ et ventre albis, fasciâ pectorali latissimâ æneo-nigrâ, lateribus nigro-cinereis albo variegatis; remigum rectricumque paginâ inferiore nigricanti-cinereâ, illorum pogoniis internis basin versùs albis; rostro et pedibus nigris: long. tota 8·0, alæ 3·9, caudæ 3·2, rostri a rictu 1·5.

Hab. in Isthmo Panamensi et in Columbiâ boreali.

Obs. Species fronte nigrâ, regione auriculari albâ, et gulâ albâ nigro circumdatâ à præcedentibus distinguenda.

WHATEVER may be the case with the birds represented in the four preceding plates, there can be no question, I think, of the claims of the present Puff-bird to full specific rank. Although it closely agrees with the group of *B. macrorhynchus* in the general system of its coloration, the wholly black front, the conspicuous white ear-coverts, and the extension of the wide pectoral band along the sides of the throat up to the base of the bill are well-marked characters, and render it easily distinguishable from the allied species.

The Pectoral or Wide-banded Puff-bird was first made known to science in 1847, by a figure published in Gray and Mitchell's 'Genera of Birds.' For many years the typical specimen in the British Museum, which had been obtained from a dealer in 1843, remained unique, and the true *patria* of the species was unknown. But when in 1861 Mr. James M'Leannan, then track-master of Lion-hill station on the Panama Railway, began to explore the dense tropical forests surrounding his abode, and to transmit specimens of the birds that he procured to the well-known ornithologist Mr. G. N. Lawrence of New York, these and many other secrets of nature

were speedily brought to light. Amongst the many interesting species, of which examples were sent to Mr. Lawrence to be catalogued in his series of papers on Mr. M'Leannan's collections, were examples of this fine Puff-bird, of which the true "habitat" was thus definitely ascertained. The collection of Salvin and Godman and my own cabinet were likewise subsequently supplied with examples from the same quarter; but the bird does not appear to be very abundant in the district traversed by the Panama Railway; and Mr. Salvin tells me that he did not fall in with it when he visited Mr. M'Leannan in 1863, and inspected his collecting-ground.

About the Isthmus of Panama this species probably reaches its northern limit, as it has never occurred, so far as I know, in collections from Costa Rica or anywhere else to the north. But southwards it extends far into the interior of the United States of Colombia, as we know from its having been recently obtained by two collectors in that republic. Mr. Claude W. Wyatt met with a single specimen of it in the dense forests of the Magdalena valley during the journey of which he has given such an interesting account in 'The Ibis' for 1871, between Naranjo and the river Magdalena in about 7° N. lat. Mr. Wyatt noted the iris as "brown." More to the westward Mr. T. K. Salmon fell in with it on the Rio Neche or Nichi—a confluent of the Rio Cauca, where his collecting-place was a little above Dos Bocas.

Both Mr. Wyatt's and Mr. Salmon's specimens, which are now in the collection of Messrs. Salvin and Godman, fully agree with the Panama skins.

The series of *Bucco pectoralis* before me consists of the following specimens:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	inc.	P. L. S.	Panama (<i>M'Leannan</i>).	8·0	3·9	3·2	1·5
2.	♂	S.-G.	Panama (<i>M'Leannan</i>).	8·0	4·0	3·2	1·6
3.	inc.	S.-G.	Chépo, Panama (<i>Arcé</i>).	8·2	3·8	3·3	1·6
4.	inc.	S.-G.	Valley of Magdalena (<i>Wyatt</i>).	8·2	3·7	3·2	1·5
5.	♂	S.-G.	Antioquia (<i>Salmon</i>).	9·0	3·8	3·3	1·5

The example figured (Plate XXIV.) is No. 1.



W. Woodhouse del.

Hanhart imp.

BUCCO ORDI.

BUCCO ORDI.

ORD'S PUFF-BIRD.

PLATE XXV.

Bucco ordii, Cassin, Pr. Ac. Nat. Sc. Phil. 1851, p. 154, pl. 8.

Bucco ordi, Scl. Ann. N. H. ser. 2, xiii. p. 359 (1854).

Bucco ordi, Scl. Syn. Bucc. p. 9 (1854).

Bucco ordi, Scl. P. Z. S. 1855, p. 196.

Tamatia ordi, Bp. Consp. Vol. Zyg. p. 13 (1854).

Bucco ordii, Pelz. Sitz. Ak. Wien, xx. p. 510 (1856).

Bucco ordi, Scl. P. Z. S. 1857, p. 262.

Notharchus ordi, Cab. et Hein. Mus. Hein. iv. p. 152 (1863).

Bucco ordii, Pelz. Orn. Bras. p. 22 (1871).

Bucco ordi, Scl. et Salv. Nomencl. p. 105 (1873).

Suprà niger, in dorso æneo lavatus; fronte angustâ et torque colli postici albis; secundariis et caudæ tectricibus superioribus albo terminatis; caudâ nigrâ albo medialiter transfasciatâ et terminatâ; subtus gulâ et cervice totâ albis, vittâ pectorali nigrâ, fasciâ latiore caféo-brunnæ subtus marginatâ, ventre et crisso albis nigro variegatis; subalaribus nigris, remigum pogoniis internis basin versùs albis; rostro et pedibus nigris: long. tota 7·8, alæ 3·4, caudæ 2·5, rostri a rictu 1·4.

Hab. in Amazoniâ.

Obs. Species a præcedentibus ventris colore brunneo et fasciâ caudæ albâ primo visu distinguenda.

IN the autumn of 1856 I had the good fortune to pass nearly a month at Philadelphia, and to be able to devote much time to the examination of the magnificent series of birds belonging to the Academy of Natural Sciences of that city. There also I had the pleasure of making the acquaintance of the late John Cassin, one of the first of his countrymen who paid attention to general ornithology, and who at that time had the care of the ornithological gallery of the Academy. Amongst the many rare types which I inspected under Mr. Cassin's guidance was the original specimen of the present Puff-bird, described by him in 1851, and named after Mr. George Ord, of Philadelphia, "the Nestor of American naturalists, the early and constant friend and biographer of the great Alexander Wilson."

The locality attributed to the Philadelphian specimen, which I believe was purchased of a dealer in Paris, is "Venezuela." We have, however, fortunately more certain information on this subject from Natterer, who as long ago as 1831 had obtained examples of this species on the Rio Xié and Rio Içanna—two upper confluent of the Rio Negro—though his discovery of it was not made known until after Cassin's publication. Natterer met with a pair near a "sitio," on the Rio Xié, sitting still on a high tree, and obtained a single female on the Rio Içanna.

SCL. Jac. & Puffb. No. XI.—May, 1880.

M

The pair were in full moult in the month of May. The eye-ring is noted as "black; the lower eyelid greenish grey; the rest of the naked skin round the eye dark grey; the iris dark brown; the feet dark grey, and the claws black."

A single example of this *Bucco* occurred in a collection transmitted by Mr. H. W. Bates from Ega, on the Amazons, of which I gave an account in the 'Proceedings' of the Zoological Society for 1857, so that it must also be found in Upper Amazonia. But it is decidedly a rare species, and to be seen in very few museums. The only example I have been able to secure for myself during many years' assiduous bird-collecting was purchased of Madame Verdey, of Paris, in 1871, and is labelled "Oyapok," though I am by no means sure of the correctness of the locality. It is represented in the accompanying Plate (XXV.).

The plumage of this specimen above is generally of a dull black, deep black on the head, and glossed with greenish on the back. The outer secondaries and upper tail-coverts show slight white marginations at the tips. A narrow frontal band joining the eyes and another band round the back of the neck are white. The throat and sides of the neck are white. The white throat is bordered below by a black pectoral band, which is much narrowed in the centre and broadens on each side. This is succeeded by a broader band of coffee-brown, which extends under the wings on both sides. The belly and flanks are greyish black, thickly spotted with white. The interior of the wings is crossed by a broad white band, formed by the inner webs of the remiges being white at their bases. The tail is black, tipped narrowly with white, and crossed about halfway down by a white bar formed by white blotches on the inner webs of the tail-feathers. The bill and legs are black.



BUCCO TECTUS.

THE BANDED PUFF-BIRD.

PLATE XXVI.

- Barbu à poitrine noire de Cayenne*, Daub. Pl. Enl. 688. fig. 2.
Le plus petit Tamatia noir et blanc, Buff. Hist. Nat. vii. p. 99 (1780).
Bucco tectus, Bodd. Tabl. d. Pl. Enl. p. 43 (1783).
Bucco melanoleucos, Gm. Syst. Nat. i. p. 406 (1788).
Bucco melanoleucos, Lath. Ind. Orn. i. p. 203 (1790).
Petit Tamatia à plastron noir, Levaill. Ois. de Par. ii. p. 93, t. 40 (1806).
Bucco melanoleucos, Vieill. Nouv. Dict. iii. p. 241 (1816).
Lesser Pied Barbet, Lath. Gen. Hist. iii. p. 220 (1822).
Bucco melanoleucus, Vieill. Enc. Méth. p. 1420 (1823).
Bucco melanoleucos, Licht. Verz. d. Doubl. p. 8 (1823).
Capito melanoleucus, Wagl. Syst. Av. *Capito*, sp. 2 (1827).
Tamatia melanoleucus, Less. Tr. d'Orn. p. 167 (1831).
Bucco tectus, Gray et Mitch. Gen. B. i. p. 74 (1847).
Bucco tectus, Gray, List of Fiss. B. M. p. 47 (1848).
Capito melanoleucus, Bp. Consp. i. p. 146 (1850).
Bucco tectus, Scl. Ann. Nat. Hist. ser. 2, xiii. p. 359 (1854).
Bucco tectus, Scl. Syn. Bucc. p. 9 (1854).
Capito melanoleucus, Bp. Consp. Vol. Zyg. p. 13 (1854).
Bucco tectus, Scl. P. Z. S. 1855, p. 196.
Bucco melanoleucus, Pelz. Sitz. Ak. Wien, xx. p. 510 (1856).
Capito melanoleucus, Burm. Syst. Ueb. ii. p. 284 (1856).
Bucco tectus, Scl. Cat. A. B. p. 270 (1862).
Nothruscus tectus, Cab. et Hein. Mus. Hein. iv. p. 146 (1863).
Bucco tectus, Scl. et Salv. P. Z. S. 1867, p. 582.
Bucco tectus, Pelz. Orn. Bras. p. 21 (1871).
Bucco tectus, Scl. et Salv. Nomencl. p. 105 (1873).
Bucco tectus, Layard, Ibis, 1873, p. 391.

Suprà niger, pilei plumarum maculis terminalibus, strigâ capitis utrinque per oculos transeunte, scapularium apicibus latis et tectricum alarium et supracaudalium marginibus angustis albis; subtùs albus, pectoris vittâ latâ nigrâ; lateribus nigricantibus albo mixtis; caudâ nigrâ, rectricum lateralium fasciâ mediâ e maculis quadratis in pogoniis interioribus compositâ, necnon rectricum apicibus albis; remigum paginâ inferiore obscurè cineraceâ, horum pogoniis internis basin versus albis; rostro et pedibus nigris: long. tota 6·0, alæ 2·9, caudæ 2·1, rostri a rictu 1·0.

Hab. in Cayennâ, Guianâ et Amazoniâ inferiore.

THE two Pied Puff-birds of Cayenne were amongst the numerous species from that French colony described by Buffon in his 'Histoire Naturelle,' and figured in the accompanying 'Planches Enluminées.' To the figure of the present bird—the smaller of the two—given in the latter work Boddaert in 1783 applied the name *Bucco tectus*, and Gmelin in 1789 that of *Bucco melanoleucus*. According to the prevalent practice I adopt the former of these forms as having priority, although I have always regarded it as a great mistake that Boddaert's obscure catalogue was ever recognized by naturalists, and his names allowed to supersede others which had so long remained in general use.

In 1806 Levaillant figured this bird in the second volume of his 'Oiseaux de Paradis' under the denomination "*Petit Tamatia à plastron noir*." Levaillant's specimens were from Cayenne and Surinam, whence he received them along with examples of the Larger Pied Puff-bird, *B. macrorhynchus*.

Schomburgk does not include *Bucco tectus* in his list of the adjoining territory of British Guiana; but there is no doubt that it also occurs there, because Mr. H. Whitely has recently obtained examples of it at Bartica grove, on the river Essequibo.

Lower-Amazonian examples of this species do not differ from those of Guiana and Cayenne. Mr. Wallace and Mr. Layard both obtained it in the forests of Pará. Mr. Layard gives us the following note on what he observed of it:—

"I found three of these birds on some low trees in an abandoned clearing covered with second growth. Though I shot one, the other two remained quietly on the tree and allowed me to load again and fire. Even when wounded, the last one merely flew off, took a circle, and returned. Their stomachs contained insects torn into fragments, I presume, by the curious double hook of the powerful bill."

Natterer met with *Bucco tectus* in the vicinity of Manaos, at the mouth of the Rio Negro. He found it "solitary, perched on high dried trees," and describes the bill as black, the naked skin round the eye blackish grey, the iris dark brown, and the feet greyish black.

The examples of *Bucco tectus* in my own collection and that of Messrs. Salvin and Godman measure as follows:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	inc.	P. L. S.	Cayenne.	6·0	2·9	2·1	1·0
2.	♀	S.-G.	Brit. Guiana (<i>Whitely</i>).	5·7	2·9	2·2	1·1

BUCCO PICATUS.

THE AMAZONIAN BANDED PUFF-BIRD.

Bucco picatus, Scl. P. Z. S. 1855, p. 194.

Nothriscus picatus, Cab. et Hein. Mus. Hein. iv. p. 146 (1863).

Bucco picatus, Scl. et Salv. P. Z. S. 1873, p. 295.

Bucco picatus, Scl. et Salv. Nomencl. p. 105 (1873).

Suprà niger, pilei plumarum maculis terminalibus, strigâ capitis utrinque per oculos transeunte et scapularium apicibus latis albis; subtùs albus, pectoris vittâ latâ nigrâ; lateribus nigricantibus albo mixtis; caudâ nigrâ, rectricum trium utrinque lateralium fasciâ medianâ e maculis quadratis compositâ necnon rectricum omnium apicibus albis; remigum paginâ inferiore obscurè cineraceâ, horum pogoniis internis basin versùs albis; rostro et pedibus nigris: long. tota 6·8, alæ 3·1, caudæ 3·7, rostri a rictu 1·2.

Hab. in Amazoniâ superiore.

Obs. Simillimus *B. tecto*, sed crassitie majore, colore nigro saturatiore et caudæ rectricibus sex mediis omninò immaculatis distinguendus.

THE Upper-Amazonian form of the Banded Puff-bird is rather difficult to deal with satisfactorily; and it is not without some hesitation that I give it a place in the present volume as a distinct species. I first met with an example of this bird in the large collection from the Huallaga received by Mr. Gould from Mr. John Hauxwell in 1854, and, with Mr. Gould's kind permission, described it as *Bucco picatus*, pointing out that, besides its larger size and darker black plumage, it was distinguishable from *B. tectus* in not having so many of the lateral tail-feathers barred with white at the middle of their length. The specimen upon which I established the species is now in the British Museum.

The only other individual of this form which I have seen is an example in the collection of Messrs. Salvin and Godman, which formed part of the extensive series recently obtained in the vicinity of Sarayacu in Eastern Ecuador by Mr. Clarence Buckley. This specimen, while agreeing with the type of *B. picatus* in the several particulars in which it differs from *B. tectus*, has the top of the head thickly spotted with white, as is usual in the latter species, whereas in the type of *B. picatus* the head is nearly of a uniform black, having only a few scattered spots on the forehead. After closely comparing these two specimens, however, I have come to the conclusion that they are undoubtedly referable to the same species, and that the absence of the white head-spots in the example now in the British Museum is an individual variation due to the spots having been worn off. I have an example of *Bucco subtectus* in which the same

thing has occurred ; and when spots, as in this case, are placed just at the extreme points of the feathers, it is obvious that slight attrition is sufficient to cause their disappearance.

I have not thought it necessary to give a figure of this species, which cannot be regarded as completely established until more examples have been received. There can be no difficulty in recognizing it, from its close resemblance to *B. tectus* except in the characters above pointed out.



W. Woodhouse del.

H. Hartert imp.

BUCCO SUBTECTUS.

BUCCO SUBTECTUS.

THE NARROW-BANDED PUFF-BIRD.

PLATE XXVII.

Bucco subtectus, Scl. P. Z. S. 1860, p. 296.

Bucco tectus, Lawr. Ann. L. N. Y. vii. p. 318 (1861).

Bucco subtectus, Scl. Cat. A. B. p. 270 (1862).

Nothriscus subtectus, Cab. et Hein. Mus. Hein. iv. p. 147 (1863).

Bucco subtectus, Scl. et Salv. P. Z. S. 1864, p. 363.

Bucco subtectus, Scl. et Salv. Nomencl. p. 106 (1873).

Bucco subtectus, Scl. et Salv. P. Z. S. 1879, p. 536.

Suprà niger, pilei antici plumarum maculis terminalibus, strigâ capitis utrinque per oculos transeunte et scapularium apicibus latis albis; subtùs albus, pectoris vittâ angustâ nigrâ, lateribus nigro-cinereis albo mixtis; caudâ nigrâ, rectricum lateralium fasciâ medianâ e maculis quadratis in pogoniis interioribus compositâ, necnon rectricum apicibus albis; remigum paginâ inferiore obscurè cineraceâ, horum pogoniis internis basin versùs albis: rostro et pedibus nigris: long. tota 5·9, alæ 2·0, caudæ 2·2, rostri 1·0.

Hab. in Æquatoriâ occidentali, Columbiâ boreali et in isthmo Panamensi.

Obs. Species *B. tecto* valdè similis, sed pileo postico immaculato, torque colli angustiore et crassitie paulò minore plerumque distinguenda.

MR. LOUIS FRASER, a well-known collector, on his return from Guayaquil to Panama in 1859, passed a few weeks at Esmeraldas, the chief Pacific port of the northern part of Ecuador, which had not been previously visited by any naturalist. Amongst the birds collected on this occasion, of which I gave an account in a paper read before the Zoological Society in 1860, was a single example of the present species of *Bucco*. This I proposed to call *Bucco subtectus*, as being a closely allied representative form of the well-known *B. tectus* of the opposite shores of South America. Mr. Fraser obtained but one example of this species, which he noticed as having the irides hazel, and the bill, legs, and feet black.

From the littoral of Western Ecuador *Bucco subtectus*, like many other species of the same district, extends northwards into the Panamanic isthmus. Here numerous examples of it were procured in 1861 and the following years by Mr. J. M'Leannan, the energetic trackmaster of Lion-hill Station, on the Panama Railway. In 1876 Mr. Salvin received a single skin of the same bird from his collector Arcé, then in Veragua, which is the furthest locality in this direction yet recorded for the present species.

We have, however, lately obtained evidence of the extension of *Bucco subtectus* in another

direction. Among the birds collected by the late Mr. T. K. Salmon at Nichi, in the province of Antioquia, of which Mr. Salvin and I have given an account in the 'Proceedings' of the Zoological Society for 1879, were several examples which must be referred to this species. They have the same narrow breast-band as in the Panama and Western-Ecuador form, but rather less spotting on the head, this feature being restricted in one example to a few specks of white on the forehead. The tail is banded throughout, except on the two middle rectrices, as in *B. tectus*.

We have, unfortunately, as yet, no accounts of the habits of this Puff-bird.

The following table gives the localities and dimensions of the examples of this species in my collection and in that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♂	P. L. S.	Esmeraldas, Ecuador (<i>Fraser</i>).	5·9	2·8	2·2	0·95
2.	♂	P. L. S.	Nichi, Antioquia (<i>Salmon</i>).	6·0	2·6	2·2	1·00
3.	♂	S.-G.	Nichi, Antioquia (<i>Salmon</i>).	6·1	2·5	2·2	1·00
4.	inc.	P. L. S.	Panama (<i>M' Cleannan</i>).	5·7	2·8	2·3	1·00
5.	♂	S.-G.	Panama (<i>M' Cleannan</i>).	5·7	2·7	2·2	1·00
6.	♀	S.-G.	Panama (<i>M' Cleannan</i>).	5·7	2·7	2·3	1·10
7.	♂	S.-G.	Panama (<i>M' Cleannan</i>).	5·8	2·7	2·2	1·00
8.	♀	S.-G.	Veragua (<i>Arcé</i>).	5·2	2·7	2·2	1·00

The upper figure (Plate XXVII.) is taken from No. 1, the lower figure from No. 2.



J.C. Keulemans del.

Hanhart imp.

BUCCO MACRODACTYLUS.

BUCCO MACRODACTYLUS.

THE LONG-TOED PUFF-BIRD.

PLATE XXVIII.

Cyphos macrodactylus, Spix, Av. Bras. i. p. 51, t. 39. fig. 2 (1824).

Capito cyphos, Wagl. Syst. Av. *Capito*, sp. 4 (1827).

Tamatia macrodactylus, Less. Tr. d'Orn. p. 168 (1831).

Capito macrodactylus, Bp. P. Z. S. 1837, p. 119.

Capito cyphos, Tsch. Faun. Per. Aves, p. 259 (1845-46).

Bucco macrodactylus, Gray et Mitch. Gen. B. i. p. 74 (1846).

Capito macrodactylus, Bp. Consp. i. p. 146 (1850).

Bucco macrodactylus, Scl. Ann. N. H. ser. 2, xiii. p. 364 (1854).

Bucco macrodactylus, Scl. Syn. Bucc. p. 14 (1854).

Cyphos macrodactylus, Bp. Consp. Vol. Zyg. p. 13 (1854).

Bucco macrodactylus, Scl. P. Z. S. 1855, pp. 136, 196.

Bucco macrodactylus, Pelz. Sitz. Ak. Wien, xx. p. 510 (1856).

Capito macrodactylus, Burm. Syst. Ueb. ii. p. 285 (1856).

Bucco macrodactylus, Scl. P. Z. S. 1857, p. 261.

Bucco macrodactylus, Scl. P. Z. S. 1858, p. 60.

Bucco macrodactylus, Scl. Cat. A. B. p. 271 (1862).

Argicus macrodactylus, Cab. et Hein. Mus. Hein. iv. p. 148 (1863).

Bucco macrodactylus, Scl. et Salv. P. Z. S. 1866, p. 192.

Bucco macrodactylus, Scl. et Salv. P. Z. S. 1867, p. 751.

Bucco macrodactylus, Pelz. Orn. Bras. p. 22 (1871).

Bucco macrodactylus, Scl. et Salv. P. Z. S. 1873, p. 295.

Bucco macrodactylus, Scl. et Salv. Nomencl. p. 106 (1873).

Suprà obscurè brunneus; interscapulii et secundariorum plumis ochraceo angustissimè terminatis; pileo ferrugineo, torque cervicis posticæ magis ochraceo; capitis lateribus nigris, suprà supercilio albo, subtùs fasciâ albâ limbatis; subtùs ochraceo-albidus, gulâ intensiore, torque pectorali nigro, abdomine nigro tenuissimè translineolato; subalaribus et remigum marginibus internis ochraceis; rostro et pedibus nigris: long. tota 6·2, alæ 2·5, caudæ 2·4, rostri 1·1. *Fem.* mari similis.

Hab. in Amazoniâ superiore.

WITH *Bucco tectus* and its two nearly allied forms we leave the series of Black-and-white Puff-birds, and commence another category with the general plumage of some shade of brown, but still bearing a broad black bar across the under plumage. To this division appertain three species, all very well marked, and easily distinguished from one another—*B. macrodactylus*, *B. ruficollis*, and *B. bicinctus*.

To the well-known Bavarian naturalist Spix we are indebted for the discovery of the first of these species. Spix, however, tells us very little about *Bucco macrodactylus*, merely adding to his description and figure that he met with it in the "forests of the Amazons." Spix refers his bird to a new genus *Cyphos**—derived, I suppose, from its mode of sitting—but I do not consider that there are sufficient grounds for separating it from other species of *Bucco*. He also remarks on its long toes, whence he calls it "*macrodactylus*." But the toes of this bird do not appear to me to be proportionally longer than in the allied species.

Little more is told us about the present Puff-bird until 1837, when Prince Bonaparte included it in his list of a collection formed on the confines of Brazil and Peru, which had been placed in his hands for examination by Leadbeater, the well-known dealer. We are not told of the exact locality of this collection; but it was obviously formed somewhere on the Upper Amazons, in the same district where Spix discovered the present species. In 1845 Tschudi likewise enumerated *Bucco macrodactylus* as being one of the members of this group that occur in the Peruvian wood-district on the Upper Amazons.

My personal knowledge of this Puff-bird was first acquired from "Bogotá" skins, one of which was in my collection when I prepared my synopsis of the *Bucconidæ* in 1854, while others of the same "make" were in the British Museum. These, however, are, in all probability, obtained not from the valley of the Magdalena, where, so far as I know, there is no trace of the occurrence of this species, but from the edge of the great Amazonian basin which lies south of the Colombian capital. We likewise find that *B. macrodactylus* occurs on the Rio Napo, in Eastern Ecuador, whence examples, transmitted by Professor Jameson, were received by the late Sir William Jardine some years ago.

As will be seen by the list which is given below, the recent collectors on the Upper Amazons have obtained specimens of this Puff-bird in many localities. Mr. Edward Bartlett met with it at Sarayacu, on the Ucayali, as also at Yurimaguas, Xeberos, Chyavetas, and Chamicuros. Mr. Bates, when on the Upper Amazons, transmitted examples of it from the Rio Javari; and Mr. Hauxwell has recently sent home numerous skins of it from Elvira and Loreto-yacu. Moreover Natterer obtained a single example of this Puff-bird in 1829 high up on the Rio Madeira. It would appear, therefore, that *Bucco macrodactylus* is widely distributed throughout the wood-region drained by the upper confluent of the Amazons.

The present species is very distinct in its plumage, and cannot be readily confounded with any of its congeners. I have not observed any material differences in colour in the numerous examples that have come under my examination; and I believe the male and female to be exactly alike, though I have not had the opportunity of examining specimens positively ascertained to be of the male sex. Unfortunately we have as yet no information as to its habits or mode of nesting.

The examples of *Bucco macrodactylus* in my collection and that of Messrs. Salvin and Godman, and their dimensions, are as follows:—

* *κυφός*, *curvus*.

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♀	P. L. S.	Elvira, E. Peru (<i>Hauxwell</i>).	6·2	2·5	2·4	1·1
2.	♀	P. L. S.	Loreto-yacu, E. Peru (<i>Hauxw.</i>).	6·2	2·6	2·5	1·1
3.	—	P. L. S.	Sarayacu, E. Peru (<i>Whitely</i>).	6·3	2·7	2·5	1·1
4.	—	P. L. S.	Sarayacu, E. Peru (<i>Whitely</i>).	5·7	2·7	2·5	1·1
5.	♀	S.-G.	Chyavetas, E. Peru (<i>Bartl.</i>).	5·4	2·5	2·2	1·0
6.	—	S.-G.	Bogotá.	5·4	2·5	2·5	1·2
7.	—	P. L. S.	Bogotá.	5·8	2·5	2·5	1·1
8.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	5·3	2·7	2·3	1·1

The figure (Plate XXVIII.) is taken from No. 2.



• 11 columns lith.

Hanhart imp

BUCCO RUFICOLLIS.

BUCCO RUFICOLLIS.

THE RED-NECKED PUFF-BIRD.

PLATE XXIX.

- Capito ruficollis*, Wagler, Isis, 1829, p. 658.
Tamatia gularis, d'Orb. et Lafr. Rev. Zool. 1838, p. 166.
Bucco ruficollis, Gray et Mitch. Gen. B. i. p. 74 (1846).
Capito ruficollis, Bp. Consp. i. p. 146, et
Capito gularis, Bp. ibid. (1850).
Bucco ruficollis, Scl. Ann. N. H. ser. 2, xiii. p. 360 (1854).
Bucco ruficollis, Scl. Syn. Bucc. p. 10. t. i. (1854).
Chaunornis ruficollis, Bp. Consp. Vol. Zyg. p. 13 (1854).
Bucco ruficollis, Scl. P. Z. S. 1855, p. 196.
Bucco ruficollis, Cassin, Pr. Acad. Phil. xii. p. 134 (1860).
Bucco ruficollis, Scl. Cat. A. B. p. 270 (1862).
Hypnelus ruficollis, Cab. et Heine, Mus. Hein. iv. p. 144 (1863).
Bucco ruficollis, Scl. et Salv. P. Z. S. 1870, p. 781.
Bucco ruficollis, Wyatt, Ibis, 1871, p. 374.
Bucco ruficollis, Scl. et Salv. Nomencl. p. 106 (1873).
Bucco ruficollis, Salvin, Ibis, 1880, p. 175.

Suprà fuscus albescenti variegatus, fronte rufescente; loris et plumis auricularibus cum torque cervicis posticæ albis; subtùs sordidè albus, gutture rufo, vittâ pectorali nigrâ, lateribus nigro sparsim maculatis; rostro et pedibus nigris; subalaribus et remigum marginibus internis albis cinnamomeo perfusis: long. tota 8·4, alæ 3·5, caudæ 3·4, rostri 1·6. *Fem.* mari similis.

Hab. in Columbiâ littorali, in valle fl. Magdalenæ.

THIS is likewise a well-marked species, perfectly distinct from all its congeners, but in structure closely approximating to *Bucco bicinctus*. Messrs. Cabanis and Heine have placed it, along with the last-named bird, in a separate genus (*Hypnelus*). But it appears to me quite unwise to split up genera into such multitudinous divisions, based upon trifling characters, as are proposed by these authors in this and other cases. This far too prevalent practice, which has now been carried to such an excess that nearly every well-marked species is become the type of a genus, throws a great burden upon the memory, and, in my opinion, offers no accompanying advantages in ensuring a more natural classification.

The well-known German naturalist Wagler published the first description of the present Puff-bird in 1829, in an article in the 'Isis,' containing additions and corrections to his 'Systema Avium.' Wagler took his description from examples in the Berlin Museum, and adopted

Lichtenstein's unpublished appellation for the species. But he made an unfortunate mistake in the locality, which he gave as "Mexico," whereas, as we are informed by Messrs. Cabanis and Heine, the typical examples were undoubtedly collected by Häberlin in the vicinity of Carthagena.

It was perhaps owing to this error that in 1838 this Puff-bird was redescribed by MM. d'Orbigny and Lafresnaye under the fresh name *gularis*. The types of these naturalists were also obtained near Carthagena by the French naval officer Candé, the same individual, I believe, after whom *Chiromachæris candæi* was named.

In 1853 the brothers Verreaux, of Paris, received several examples of *B. ruficollis* from a collector then in correspondence with them at Santa Marta, a well-known port of the Colombian republic, situated to the east of Carthagena. One of these specimens is still in my collection, and is the subject of the accompanying figure (Plate XXIX).

All other examples of the present species which I have met with have been obtained either in the same tract of country or at no very great distance off. In the collection of Messrs. Salvin and Godman is a specimen from Savanilla, received through the Smithsonian Institution, and another procured by Mr. F. Simons at Valle Dupar, in the district of the Sierra Nevada of Santa Marta, in February 1878*. The latter is marked "eyes pale brown." Mr. Claude Wyatt, during his journey into the adjoining province of Ocaña in 1871, obtained several examples of this Puff-bird. Mr. Wyatt tells us that it is a common bird near Santa Marta, but was met with only on a single occasion "up the country." The crops of those examined were full of beetles. Finally, Mr. Anton Goering, during his visit to the Andes of Merida in 1869, obtained an example of *Bucco ruficollis* to the south-east of that city, probably on his route to it from the Lake of Maracaibo.

It will be seen therefore that, so far as our present knowledge extends, the present bird is nearly confined to the north littoral portion of the U. S. of Colombia—that is, to the extreme lower part of the Magdalena valley.

There is no difficulty in distinguishing *Bucco ruficollis* from its congeners. It is the only member of the brown group of the genus besides *B. macrodactylus* that has a single well-defined black pectoral bar. From *B. macrodactylus* it may be readily known by its much larger size and bright rufous throat.

The dimensions of the specimens of this species in my collection and that of Messrs. Salvin and Godman are as follows:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Santa Marta (<i>Verreaux</i> , 1853)	8·4	3·5	3·4	1·6
2.	—	S.-G.	Savanilla, U. S. Col.	7·7	3·5	3·3	1·5
3.	—	S.-G.	Ocaña, U. S. Col. (<i>Wyatt</i>).	7·7	3·6	3·4	1·4
4.	--	S.-G.	Valle Dupar, U.S. Col. (<i>Simons</i>).	7·7	3·4	3·2	1·6

* For an account of Mr. Simons's explorations, see Journ. R. Geogr. Soc. 1880, p. 689.



J.C. Neumeier lith.

Hanhart imp.

BUCCO BICINCTUS.

BUCCO BICINCTUS.

THE DOUBLY BANDED PUFF-BIRD.

PLATE XXX.

- Tamatia bicincta*, Gould, P. Z. S. 1836, p. 80.
Tamatia bitorquata, Sw. An. in Men. p. 327 (1838).
Bucco bicinctus, Gray et Mitch. Gen. B. i. p. 74 (1846).
Bucco bicinctus, Gray, List of Fiss. B. M. p. 48 (1848).
Capito bicincta, Bp. Consp. i. p. 146 (1850).
Bucco bicinctus, Scl. Ann. N. H. ser. 2, xiii. p. 361 (1854).
Bucco bicinctus, Scl. Syn. Bucc. p. 11, t. 2 (1854).
Chaunornis bicincta, Bp. Consp. Vol. Zyg. p. 13 (1854).
Bucco bicinctus, Scl. P. Z. S. 1855, p. 196.
Bucco bicinctus, Scl. Cat. A. B. p. 271 (1862).
Hypnelus bicinctus, Cab. et Hein. Mus. Hein. iv. p. 143 (1863).
Bucco bicinctus, Scl. et Salv. P. Z. S. 1868, p. 168.
Bucco bicinctus, Scl. et Salv. P. Z. S. 1868, p. 628.
Bucco bicinctus, Scl. et Salv. Nomencl. p. 106 (1873).

Suprà fuscus fulvescenti variegatus ; fronte, loris et regione auriculari albis ; subtùs ochraceo-rufus, vittâ alterâ pectorali alterâ ventrali et maculis quibusdam lateralibus nigris ; subalaribus et remigum marginibus internis albis cinnamomeo perfusis ; rostro et pedibus nigris : long. tota 8·0, alæ 3·5, caudæ 3·2, rostri 1·5.
Fem. mari similis.

Hab. in Venezuelâ littorali.

THIS Puff-bird has likewise been provided by naturalists with two different specific names, of which, according to orthodox practice, I employ the one first in point of date. In 1836 it was described by Mr. Gould at one of the meetings of the Zoological Society of London under the name *Tamatia bicincta*. Two years subsequently Mr. Swainson published a description of it in the appendix to his volume on Animals in Menageries (to which he gave the curious title of "Two Centenaries and a quarter of new or little-known Birds"), under the homonym *Tamatia bitorquata*.

Mr. Swainson gives "Trinidad" as the locality of his *Tamatia bitorquata*; and in my 'Synopsis of the Bucconidæ' I also stated Trinidad as within the range of this species, upon the faith of specimens of it contained in the series of bird-skins from that island formerly presented to the Zoological Society of London by Lord Harris. But I have since ascertained that the large collections imported into London as "Trinidad skins," as also other collections to which the same locality is attributed, are really received from the opposite terra firma of

Venezuela. Moreover no *Bucco* is included in Léotaud's work on the Birds of Trinidad. I think it therefore quite uncertain at present whether *Bucco bicinctus* is to be found in Trinidad, although it is not unlikely that such may be the case.

All the positively ascertained localities of the Doubly Banded Puff-bird lie along the northern coast-land of Venezuela and the U. S. of Colombia. Mr. Goering, during his travels in Venezuela, obtained specimens at Pilar and San Esteban, which are now in the collection of Messrs. Salvin and Godman. The Museum Heineanum, as stated by Messrs. Cabanis and Heine, contains examples from Puerto Cabello, whence many Venezuelan bird-skins are received in the way of trade. In the collection of Messrs. Salvin and Godman is likewise a specimen of this Puff-bird from Savanilla, near the mouth of the Magdalena, which thus extends its range further westward than any of the above-given localities.

Bucco bicinctus is readily distinguishable from all its congeners by the two bands across the lower surface, from which it has received its name. The lower of these two bands is narrower and not quite so regular as the upper one; and in some specimens the lateral spots still lower down are so arranged as to present slight indications of a third band.

We have as yet no information as to the habits of this species, or as to its mode of nesting. The sexes, I believe, are externally undistinguishable.

The following is a list of the examples of *Bucco bicinctus* in my collection and that of Messrs. Salvin and Godman, and an account of their dimensions:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Venezuela.	8·0	3·5	3·2	1·5
2.	—	P. L. S.	Venezuela.	8·4	3·5	3·2	1·4
3.	—	P. L. S.	Venezuela.	7·5	3·1	3·1	1·5
4.	♀	S.-G.	Pilar, Venezuela (<i>Goering</i> , 1867).	7·7	3·5	3·4	1·5
5.	—	S.-G.	San Esteban, Venez. (<i>Goering</i> , 1868).	7·8	3·3	3·1	1·3
6.	—	S.-G.	Savanilla, U. S. Col. (<i>Akhurst</i>).	7·8	3·5	3·4	1·4



J. E. Sclater del.

H. Hartert imp.

1 BUCCO TAMATIA
2 BUCCO PULMENTUM

BUCCO TAMATIA.

THE SPECKLED PUFF-BIRD.

PLATE XXXI. FIG. 1.

- Le Tamatia*, Buff. Hist. Nat. vii. p. 94 (1780).
Barbu à ventre tacheté de Cayenne, Daubenton, Pl. Enl. 746.
Bucco tamatia, Gm. S. N. i. p. 405 (1788).
Bucco tamatia, Lath. Ind. Orn. i. p. 201 (1790).
Tamatia à gorge rousse, Levaill. Ois. de Par. ii. p. 95, t. 41 (1806).
Bucco tamatia, Vieill. Nouv. Dict. iii. p. 241 (1816).
Tamatia maculata, Cuv. Règn. An. i. p. 429 (1817).
Spotted-bellied Barbet, Lath. Gen. Hist. iii. p. 215 (1822).
Bucco tamatia, Vieill. Enc. Méth. p. 1421 (1823).
Bucco tamatia, Licht. Doubl. p. 8 (1823).
Bucco tamatia, Vieill. Gal. Ois. i. p. 21, t. 34 (1825).
Capito tamatia, Wagl. Syst. Av. *Capito*, sp. 6 (1827).
Tamatia maculata, Sw. B. of Brazil, pl. 11 (1841).
Nyctactes tamatia, Strickl. Ann. N. H. vi. p. 418 (1841).
Chaunornis tamatia, Gray, List of Gen. B. p. 13 (1841).
Bucco tamatia, Gray et Mitch. Gen. B. p. 74 (1846).
Bucco tamatia, Cab. in Schomb. Guian. iii. p. 719 (1848).
Bucco tamatia, Gray, List of Fiss. B. M. p. 48 (1848).
Tamatia tamatia, Bp. Consp. i. p. 146 (1850).
Capito tamatia, Bp. Consp. Vol. Zyg. p. 13 (1854).
Bucco tamatia, Scl. Ann. N. H. ser. 2, xiii. p. 360 (1854).
Bucco tamatia, Scl. Syn. Bucc. p. 10 (1854).
Bucco tamatia, Scl. P. Z. S. 1855, p. 196.
Capito tamatia, Burm. Syst. Ueb. ii. p. 286 (1856).
Bucco tamatia, Pelz. Sitz. Ak. Wien, xx. p. 509 (1856).
Bucco tamatia, Scl. Cat. A. B. p. 270 (1862).
Chaunornis tamatia, Cab. et Hein. Mus. Hein. iv. p. 144, et
Chaunornis hypnalea, Cab. et Hein. ibid. p. 145 (1863).
Bucco tamatia, Scl. et Salv. P. Z. S. 1867, p. 582.
Bucco tamatia Pelz. Orn. Bras. p. 22 (1871).
Bucco tamatia, Scl. et Salv. Nomencl. p. 166 (1873).

Suprà fuliginoso-brunneus rufescenti plus minùsve transversim striatus, fronte et superciliis rufescentibus, torque angusto cervicis posticæ et lineâ utrinque suboculari albis; collo antico ferrugineo vittâ nigrâ
SCL. Jac. & Puffb. No. XIII.—November, 1880.

utrinque marginato; ventre albo maculis nigris confertim maculato; subalaribus et remigum marginibus internis cinnamomeis; rostro nigro, pedibus plumbeis: long. tota 6·2, alæ 3·0, caudæ 2·4, rostri 1·3. *Fem.* mari similis.

Hab. in Guianâ et in Amazoniâ inferiore.

THE term employed by Buffon for this bird, "Tamatia," was adopted from Marcgrave, although it is hardly doubtful that Marcgrave had in view another species of the group. Gmelin consequently called the present species *Bucco tamatia*, a name which I continue to use, although many authors have considered it the type of a different genus—*Chaunornis* sive *Nyctactes*. But I can find no sufficient structural character to warrant its separation from the preceding members of the group.

The examples of *Bucco tamatia* described by Buffon and Levaillant were received from the French colony of Cayenne; and examples of the well-known "make" of that country are frequently to be met with in collections. In the adjoining territory of British Guiana Schomburgk found it in the deepest woods, and says it "seems to have an extensive range." "They are seen," he tells us, "in out-of-the-way places, and sit solitary or more rarely in pairs, phlegmatic and sorrowful-looking, upon the branches of the low bushes. They are by no means shy, and let one approach within six or eight steps, when they fly a little way further off and resume their melancholy posture. Their food is insects. I have never heard them utter any cry. The Macusi Indians call them 'Kawari'."

From Guiana *B. tamatia* extends far into the forests of Lower Amazonia. Mr. Wallace met with it near Para, on the Capim river, and on the Rio Negro. Natterer obtained numerous examples at Borba, on the Madeira, and on the Guaporé, one of its highest confluent, and again at Barra, Marabitanas, Forte de Rio Branco, and other localities on the Rio Negro. Natterer describes the bill as black in both sexes, the iris carmine, and the feet olive-grey.

In Upper Amazonia, as will be shown presently, *Bucco tamatia* is replaced by the closely allied form *B. pulmentum*.

In a footnote appended to their account of this species in the 'Museum Heineanum,' Messrs. Cabanis and Heine state that examples in the Berlin Museum, from Pará, are more darkly coloured than Guianan specimens, while on the other hand, as regards the colour of the front, they come nearer to *B. pulmentum*, and are also remarkable for their more deeply coloured throat, and for the greater number and intensity of the round spots on the belly. Should these differences be found constant, they propose the name *Chaunornis hypnalea* for this form.

As respects these remarks, I may observe that most of the Pará skins of this species which I have examined do not sensibly differ from the Guianan form. But, as already noted by Mr. Salvin and myself (P. Z. S. 1867, p. 582), one of Mr. Wallace's examples from the Capim river has the spots on the belly crowded together as in *B. pulmentum*. The throat, however, is as dark as in the Cayenne bird, not pale as in *B. pulmentum*. Being, as will be seen below, hardly convinced of the specific distinctness of the latter species, I do not think it necessary to say more than that I cannot admit the specific distinctness of the Lower-Amazonian form.

The following is a list of examples of *B. tamatia* in my collection and in that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Cayenne, 1847.	6·1	3·1	2·7	1·3
2.	—	S.-G.	Cayenne.	6·3	3·0	2·5	1·4
3.	♂	P. L. S.	Bartica Grove, B. Guiana (<i>Whitely</i>).	6·2	3·0	2·5	1·4
4.	♂	P. L. S.	Bartica Grove, B. G. (<i>Whitely</i>).	6·2	3·0	2·4	1·3
5.	♀	S.-G.	Bartica Grove, B. G. (<i>Whitely</i>).	6·2	3·1	2·5	1·3
6.	♂	S.-G.	Bartica Grove, B. G. (<i>Whitely</i>).	6·3	3·1	2·4	1·3
7.	♂ jr.	S.-G.	Bartica Grove, B. G. (<i>Whitely</i>).	5·5	3·0	2·0	1·1
8.	—	P. L. S.	Rio Negro (<i>Wallace</i>).	6·4	3·0	2·5	1·3
9.	♀	P. L. S.	Capim river (<i>Wallace</i>).	—	3·1	—	1·3

The figure (Plate XXXI. fig. 1) is taken from specimen No. 3.

BUCCO PULMENTUM.

THE DENSELY SPECKLED PUFF-BIRD.

PLATE XXXI. FIG. 2.

Tomatia (Nyctactes) pulmentum, Bp. et Verr. MS.

Bucco pulmentum, Scl. P. Z. S. 1855, p. 194, t. 106.

Bucco pulmentum, Scl. P. Z. S. 1857, p. 262.

Bucco pulmentum, Scl. Cat. A. B. p. 270 (1862).

Chaunornis pulmentum, Cab. et Heine, Mus. Hein. iv. p. 146 (1863).

Bucco pulmentum, Scl. et Salv. P. Z. S. 1873, p. 295.

Bucco pulmentum, Scl. et Salv. Nomencl. p. 106 (1873).

Suprà fuliginoso-brunneus, rufescenti plus minùsve transversim striatus; fronte et superciliis rufescentibus; torque angusto cervicis posticæ et lineâ utrinque suboculari albis; collo antico pallidè rufescente vittâ nigrâ utrinque marginato; ventre albo maculis rotundis nigris confertissimè maculato; subalaribus et remigum marginibus internis cinnamomeis; rostro nigro, pedibus plumbeis: long. tota 6·4, alæ 2·9, caudæ 2·2, rostri 1·1. *Fem.* mari similis.

Hab. in Amazoniâ superiore.

Obs. Species præcedenti simillima, et fronte paulum rufescentiore, gutture dilutiore et ventris maculis crebrioribus et magis nigris vix diversa.

THE late Prince Charles Bonaparte, formerly Prince of Canino and Musignano, was certainly one of the most remarkable men I have ever been acquainted with. Always ardently attached to the study of natural objects, especially of birds, he was at various periods of his life (when he was forced to abstain from politics) a hard and skilful worker in ornithology. As the author of the well-known continuation of Wilson's 'Birds of America,' and of numerous other works and papers, above all of the celebrated 'Conspectus Generum Avium,' his name will ever live in the annals of our science. A most keen and accurate observer, he was always able to say at a glance whether a species was new to him or not, and ready to bestow on it an appropriate, if not always strictly classical, name.

The latter part of his life Bonaparte passed at Paris in his house in the Rue de Lille, where ornithologists of all countries found a ready welcome. It was here, on the occasion of one of the many visits I paid to him, that he showed me the first examples I had met with of the present Puff-bird, and told me that he should call it "*pulmentum*," from the plum-pudding-like appearance of its belly. This name, however, he never published; and it remained in MS., attached to the labels of the bird-skins of Verreaux frères upon which it was originally written, until I described the species under the same name about a year later.

Whether, however, *Bucco pulmentum* is really entitled to the dignity of a particular specific

name is, I think, a little questionable. The differences discoverable upon a careful comparison of it with *B. tamatia* are, as I stated when I characterized the bird, somewhat slight: I have added a summary of them to my specific diagnosis. Moreover, as already pointed out in the letterpress relating to the previous species, some of them do not appear to be quite constant. At the same time I may remark that all the examples of *B. pulmentum* which I have seen have the throat of a much paler and more rufescent colour than in *B. tamatia*, and the front of a paler and more fulvous hue, which, moreover, extends over the anterior part of the head.

Numerous examples of *B. pulmentum* have been obtained in the wood-region of Eastern Peru by the well-known collectors who have of late years visited that district. Mr. Bates when on the Upper Amazons procured it from his correspondents on the Rio Javari. Mr. E. Bartlett, who met with it at Chamicuros, has kindly furnished me with the following notes on its habits:—

“Although I obtained many specimens of this pretty little *Bucco* in Chamicuros, it was far from common. It was met with in pairs, and, like all its congeners, was only to be found in the most lonely and dense parts of the forest. Here it was seen watching for its prey from a dead branch of a tree, about fifteen to twenty feet from the ground.

“I did not obtain or observe this species in any other locality during my stay in Eastern Peru.”

I subjoin a list of the examples of this form of *Bucco tamatia* in my collection and in that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Upper Amazons (<i>t</i>).	7·1	3·0	2·4	1·1
2.	—	P. L. S.	Chamicuros, E. Peru (<i>E. Bartlett</i>).	6·2	2·8	2·4	1·1
3.	—	P. L. S.	Chimacuros, E. Peru (<i>E. Bartlett</i>).	6·4	2·9	2·2	1·1
4.	—	S.-G.	Chamicuros, E. Peru (<i>E. Bartlett</i>).	6·3	2·9	2·3	1·1
5.	—	P. L. S.	Sarayacu, Ecuador (<i>Buckley</i>).	6·0	3·1	2·5	1·2
6.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	6·5	3·0	2·5	1·2
7.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	5·8	3·0	2·2	1·1
8.	—	S.-G.		6·4	3·0	2·4	1·2

The figure (Plate XXXI. fig. 2) is taken from No. 3. No. 1 is the type of the species as described and figured, P. Z. S. 1855, p. 194, pl. 106.



Hanhart imp

BUCCO MACULATUS

BUCCO MACULATUS.

THE SPOTTED PUFF-BIRD.

PLATE XXXII.

- Ispida brasiliensis nævia*, Briss. Orn. iv. p. 524 (1760).
Alcedo maculata, Gm. Syst. Nat. i. p. 451 (1788).
Alcedo maculata, Lath. Ind. Orn. i. p. 258 (1790).
Tamatia tamajac, Levaill. Ois. de Par. iii. Suppl. p. 44, t. F (1806).
Bucco somnolentus, Licht. Doubl. p. 8 (1823).
Capito maculatus, Wagl. Syst. Av. *Capito*, sp. 7 (1827).
Tamatia tamajac, Less. Trait. d'Orn. p. 168 (1831).
Tamatia somnolenta, Sw. B. of Brazil, t. 9 (1841).
Bucco maculatus, Gray et Mitch. Gen. B. i. p. 74 (1846).
Bucco maculatus, Gray, List of Fiss. B. M. p. 48 (1848).
Tamatia maculata, Bp. Consp. i. p. 147 (1850).
Capito maculatus, Burm. Syst. Ueb. ii. p. 289 (1851).
Bucco maculatus, Scl. Ann. N. H. ser. 2, xiii. p. 363 (1854).
Bucco maculatus, Scl. Syn. Bucc. p. 13 (1854).
Nyctastes maculatus, Bp. Consp. Vol. Zyg. p. 13 (1854).
Bucco maculatus, Scl. P. Z. S. 1855, p. 196.
Bucco maculatus, Scl. Cat. A. B. p. 271 (1862).
Nystalus maculatus, Cab. et Heine, Mus. Hein. iv. p. 139 (1863).
Bucco maculatus, Scl. et Salv. Nomencl. p. 106 (1873).

Suprà nigrescens fusco maculatus; loris, superciliis et torque colli postico ex cinnamomeo albidis; subtùs albus, cervice anticâ clarè cinnamomeo-rufâ, pectore et ventris lateribus maculis rotundis nigris ornatis; ventre medio et mento purè albis; caudâ nigrâ fusco regulariter transvittatâ; subalaribus et remigum marginibus internis albis; rostro rubro, culmine et basi nigris; pedibus plumbeis: long. tota 8·0, alæ 3·2, caudæ 2·8, rostri 1·7. *Fem.* mari similis.

Hab. in Brasiliâ orientali, in vicinitate urbis Bahia.

THIS Puff-bird—one of the earliest of the group known to us, and probably the true “*Tamatia*” of Marcgrave—was first technically described by Brisson, who referred it to the Kingfishers, under the name *Ispidina brasiliensis nævia*. Upon Brisson’s description Gmelin founded his *Alcedo maculata*, and thus furnished us with the specific title by which the bird is usually known.

In 1806 Levaillant gave a description and figure of the present species in the supplementary plates attached to the third volume of his ‘Oiseaux de Paradis.’ Levaillant called it “*le Tamatia Tamajac*,” pointing out, quite correctly, that it differed from true “*Tamatia*” in the shape of the bill, and compounding a new French name for it (according to his habitual practice) from

that word and Jacamar. There can be no question, indeed, that Levaillant is right in this observation. If any division is to be made of the genus *Bucco* as here constituted, it should take place at this point in the series, and should embrace this and the four following species, which are remarkable for their compressed bills, reminding one, as Messrs. Cabanis and Heine have pointed out, of the Kingfishers of the genus *Carcineutes*. *Nystalus*, as proposed by the same authors, would seem to be the proper generic term to be used for these birds, if distinguished from *Bucco* proper.

After Levaillant, Lichtenstein appears to have been the next author who became acquainted with this species. Lichtenstein described it in 1823 in his list of duplicates of the Berlin Museum under the new name *Bucco somnolentus*. But the more accurate Wagler, in his 'Systema Avium,' published four years later, showed that this term was a mere synonym of *Bucco* (or, as he called it, *Capito*) *maculatus*; and the latter specific name has been generally adopted by subsequent writers.

A good figure of this species is given in Swainson's unfinished work on the Birds of Brazil, the plates of which were published in 1841, and are sometimes quoted as his 'Ornithological Drawings.' Swainson's figure was probably taken from examples obtained by himself during his travels in Brazil.

Bucco maculatus, so far as I can ascertain, seems to be restricted to the northern portion of the wood-region of the coast of South-eastern Brazil, and to have rather a limited range. In the neighbourhood of Bahia it is certainly abundant, examples of it being commonly met with in collections of bird-skins imported from that city, and several specimens obtained by the late Dr. Wucherer near Bahia being in the cabinets of Messrs. Salvin and Godman. It does not, however, appear to occur much further south. Prince Maximilian of Neuwied did not meet with it during his travels in the province of Bahia and adjoining districts; nor did Natterer obtain it in the southern provinces of Brazil. Dr. Burmeister, likewise, failed to meet with this species, and expresses his opinion that it is confined to the environs of Bahia and does not penetrate into the interior.

In Mato Grosso and in the adjoining districts of Bolivia the present species is replaced by the nearly allied *B. striatipectus*.

I subjoin a list of the specimens of *Bucco maculatus* in my collection and that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Brazil.	8·0	3·1	2·9	1·7
2.	—	P. L. S.	Brazil.	7·0	2·9	2·8	1·7
3.	—	P. L. S.	Brazil.	7·0	3·0	2·8	1·7
4.	—	P. L. S.	Bahia.	8·0	3·1	2·9	1·8
5.	—	S.-G.	Bahia (<i>Wucherer</i>).	8·0	3·2	2·8	1·7
6.	—	S.-G.	Bahia (<i>Wucherer</i>).	7·0	3·0	2·8	1·5
7.	—	S.-G.	Bahia (<i>Wucherer</i>).	7·5	3·0	2·9	1·7
8.	—	S.-G.	Bahia (<i>Wucherer</i>).	7·8	3·1	2·8	1·7
9.	—	S.-G.	Bahia (<i>Wucherer</i>).	7·3	3·0	2·9	1·6

The figure (Plate XXXII.) is taken from No. 4.



BUCCO STRIATIPLECTUS.

THE STRIPED PUFF-BIRD.

PLATE XXXIII.

- Bucco striatiplectus*, Scl. P. Z. S. 1853, p. 123.
Bucco striatiplectus, Scl. Ann. N. H. ser. 2, xiii. p. 364 (1854).
Bucco striatiplectus, Scl. Syn. Bucc. p. 14 (1854).
“*Nyctactes flammulatus*, Verr.” Bp. Consp. Vol. Zyg. p. 13 (1854).
Bucco striatiplectus, Scl. P. Z. S. 1855, p. 196.
Bucco maculatus, Pelz. Sitz. Ak. Wien, xx. p. 509 (1856).
Bucco striatiplectus, Scl. Cat. A. B. p. 271 (1862).
Nystalus striatiplectus, Cab. et Hein. Mus. Hein. iv. p. 140 (1863).
Bucco maculatus, Pelz. Orn. Bras. p. 22 (1871).
Bucco striatiplectus, Scl. et Salv. Nomencl. p. 106 (1873).
Bucco striatiplectus, Scl. et Salv. P. Z. S. 1879, p. 633.

Suprà nigrescens, alis caudâque magis brunnescens, omnino fusco maculatus; loris, superciliis et torque colli postici ex cinnamomeo albidis; subtus albus, cervice anticâ clarè cinnamomeo-rufâ; pectore et ventris lateribus nigro striatis; ventre medio et mento purè albis; caudâ nigrâ, fusco regulariter transvittatâ; subalaribus et remigum marginibus internis albis; rostro rubro, culmine et basi nigris; pedibus plumbeis: long. tota 8·0, alæ 3·2, caudæ 2·8, rostri 1·7. *Fem.* mari similis.

Hab. in Boliviâ orientali et in parte Brasilæ adjacente.

Obs. Species *B. maculato* omninò similis, et ventris maculis elongatis striiformibus nec rotundatis solùm diversa.

SOME thirty years ago the late Mr. Argent, of Bishopsgate, then and for long afterwards well known as a natural-history dealer, had in his hands a fine series of Bolivian bird-skins, of which I was never able to ascertain the exact history. The skins were all of a peculiar “make,” and were labelled with little square-cut paper tickets, upon which the sex and other particulars were given in Spanish. Mr. G. R. Gray had the first pick of this collection for the British Museum, whilst others fell to the share of the late Mr. H. E. Strickland and myself. Amongst the latter were two examples of the present *Bucco*, of which Mr. Strickland obtained one, and the other came ultimately into my possession. As I had only recently described this species from examples in the Derby Museum (probably obtained in Bolivia by Bridges), I was much pleased with this acquisition, which, up to the present time, is the only example of this Puff-bird I have been able to obtain. Mr. Strickland’s specimen, which is nearly similar to mine, is now in the Strickland collection at Cambridge.

During his sojourn in Mato Grosso in the years 1825–29, Natterer collected ten examples
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of a Puff-bird which Herr von Pelzel has referred to *B. maculatus*. They were obtained, as we learn from Herr von Pelzel's excellent work upon Natterer's ornithological collections, at Cuyaba, Retiro, Caicara, and Santarem. These localities are all situated on the eastern extremity of Brazil, immediately adjoining the Bolivian frontier; and it is therefore probable that the species found there is not *B. maculatus*, but *B. striatipectus*—its nearly allied Bolivian representative. This is the more likely to be the case, as *B. maculatus* does not seem to occur at all in the campos of the interior of Brazil, and its recurrence in a district so far removed from the wood-region of the coast as Mato Grosso would be a by no means usual phenomenon*.

Some years ago I examined specimens of this species in the collection of Prof. Behn at Kiel. These had been obtained by the Professor near Chuquisaca in Bolivia.

In Prince Bonaparte's 'Conspectus Volucrum Zygodactylorum,' published in the 'Ateneo Italiano' for 1854, "*Nyctactes flammulatus*, Verr.," is inserted as a species to follow "*Nyctactes maculatus*." This MS. name refers to the present Puff-bird, as I have ascertained from a specimen of it in the Paris Museum, which is marked "*Chaunornis flammulata*, Verr. MS." It was procured by d'Orbigny in the province of Santa Cruz, Bolivia.

The figure of this species (Plate XXXIII.) is taken from the above-mentioned specimen in my collection. The example in the Strickland collection, which has been kindly lent to me by the Strickland Curator for comparison, is as nearly as possible similar.

* Herr von Pelzel has kindly re-examined the Nattererian specimens for me since this paragraph was written. It would seem to follow from what he tells me that all of them, except those from Santarem, belong to *B. striatipectus*, although rather small in their dimensions.

BUCCO CHACURU.

THE CHACURU PUFF-BIRD.

PLATE XXXIV.

- El Chacuru*, Azara, Pax. del Paraguay, ii. p. 330 (1805).
Bucco chacuru, Vieill. Nouv. Dict. iii. p. 239 (1816).
Bucco chacuru, Vieill. Enc. Méth. p. 1420 (1823).
Bucco strigilatus, Licht. Verz. d. Doubl. p. 8 (1823).
Capito melanotis, Temm. Pl. Col. 94 (1824).
Capito melanotis, Wagl. Syst. Av. *Capito*, sp. 5 (1827).
Tamatia melanotis, Less. Tr. d'Orn. p. 167 (1831).
Capito melanotis, Max. Beitr. iv. p. 359 (1832).
Capito leucotis, Sw. B. of Brazil, t. 10 (1841).
Capito chacuru, Strickl. Ann. N. H. vi. p. 418 (1841).
Capito melanotis, Tsch. Faun. Per. Aves, p. 259 (1845-46).
Bucco chacuru, Gray et Mitch. Gen. B. i. p. 74, et
Bucco leucotis, Gray et Mitch. ibid. p. 74 (1846).
Capito chacuru, Hartl. Ind. Az. p. 17 (1847).
Bucco chacuru, Gray, List of Fiss. B. M. p. 48 (1848).
Tamatia chacuru, Bp. Consp. i. p. 146, et
Tamatia leucotis, Bp. ibid. p. 147 (1850).
Nyctastes chacuru, Bp. Consp. Vol. Zyg. p. 13 (1854).
Bucco chacuru, Scl. Ann. N. H. ser. 2, xiii. p. 362 (1854).
Bucco chacuru, Scl. Syn. Bucc. p. 12 (1854).
Bucco chacuru, Scl. P. Z. S. 1855, p. 196.
Bucco melanotis, Burm. Syst. Ueb. ii. p. 287 (1856).
Bucco chacuru, Pelz. Sitz. Ak. Wien, xx. p. 508 (1856).
Bucco chacuru, Scl. Cat. A. B. p. 271 (1862).
Nystalus chacuru, Cab. et Hein. Mus. Hein. iv. p. 141 (1863).
Bucco chacuru, Reinh. Fuglef. Camp. Bras. p. 120 (1870).
Bucco chacuru, Scl. et Salv. Nomencl. p. 106 (1873).
Bucco chacuru, Scl. et Salv. P. Z. S. 1879, p. 633.

Suprà brunneus nigro transfasciolatus et fusco variegatus; capitis lateribus nigris; loris, superciliis et torque colli postici albis; subtus albus, in ochraceum vix trahens; pectore et ventris lateribus fasciis angustis nigris, plus minusve conspicuis, occupatis; remigibus et rectricibus fusco-nigris, his albicanti transfasciatis; subalaribus et remigum marginibus internis albis; rostro rubro, pedibus fuscis: long. tota 7·7, alæ 3·3, caudæ 2·9, rostri 1·4. *Fem.* mari similis, sed coloribus dilutioribus.

Hab. in Brasiliâ meridionali, Paraguayâ, Boliviâ et Peruviâ interiore.

THE great Spanish naturalist Don Felix de Azara was the original discoverer of this well-marked species of Puff-bird. Azara met with it in the forests of Paraguay, and described it in his celebrated work on the birds of that country as "El Chacuru," its native name among the Guarani Indians. This term was subsequently Latinized by Vieillot into *Bucco chacuru*.

Several other appellations have been bestowed on this species by subsequent writers. Lichtenstein described it in his list of the duplicates of the Berlin Museum in 1823 as *Capito strigilatus*, while in the following year Temminck figured it in his 'Planches Coloriées' as *Capito melanotis*, and in 1841 Swainson gave an illustration of it in his 'Ornithological Drawings' under the title of *Capito leucotis*. All these names were established upon specimens from South-eastern Brazil, where this bird is by no means uncommon. Prince Maximilian of Neuwied says that he met with it in the bushes and wooded valleys of Bahia, yet not very frequently. It is a still, solitary bird; and he never heard its voice. He says it is generally seen sitting on a low bough or hopping upon the ground in the thick bush. Fine specimens of this bird from the same district were obtained by the late Dr. Wucherer for Messrs. Salvin and Godman's collection. Further southwards it occurs in collections from Rio, and was received by the Berlin Museum from Sao Paulo. In the latter province Natterer obtained specimens at Matodentro, Ypanema, Ytarare, and other localities, and found "grubs and earth-beetles" in their stomachs.

Dr. Burmeister met with this Puff-bird during his stay at Lagoa Santa, in the province of Minas. It sits, he tells us, solitary and still upon exposed twigs under the forest trees, and without moving a muscle allows the observer to approach to within a distance of six or eight paces. Its food is insects, which it catches from its perch when they come near. Dr. Burmeister never obtained the nest; but was told by the Brazilians that it builds in holes in the earth and lays several white eggs.

On his journey along the Brasílio-Bolivian frontier Natterer likewise met with this Puff-bird, in several localities in the province of Mato Grosso. Castelnau and Deville found it in the same district; and d'Orbigny obtained it in the Bolivian provinces of Yungas and Santa Cruz de la Sierra. I have been able to examine specimens from both of these well-known expeditions through the courtesy of the officers of the Muséum d'Histoire Naturelle of Paris. M. Oustalet had nearly come to the conclusion that the Bolivian form belongs to a different species. But the variation from the Brazilian form is so slight that I could not venture to separate it, although some years ago, when I examined some Bolivian specimens in the collection of Professor Behn at Kiel, I was rather of the contrary opinion and had provided it with a MS. name.

On comparing the Brazilian skins in Messrs. Salvin and Godman's collection with those collected by Mr. Buckley in the Bolivian province of Yungas, I can find but slight differences. The head above is rather darker, and the whole plumage below rather more suffused with ochraceous, while the irregular cross bands on the breast and flanks are not so well defined. But I have observed the same variations in the lower plumage in some Brazilian skins. My conclusion is, therefore, that *Bucco chacuru* extends over the interior of Bolivia up to the slopes of the Western Andes. Whether it also occurs in the wood-region of Eastern Peru, as Tschudi asserts, I am not quite certain, as I have never seen examples from that locality; but I see no

reason to doubt the fact, as the province of Yungas and the wood-region of Eastern Peru have many species in common.

The following is a list of the specimens of *Bucco chacuru* in my collection and in that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Rio, Brazil.	7·1	3·2	2·6	1·4
2.	—	P. L. S.	Brazil.	7·7	3·3	2·9	1·4
3.	—	S.-G.	Bahia (<i>Wucherer</i>).	7·7	3·2	2·3	1·4
4.	—	S.-G.	Bahia (<i>Wucherer</i>).	7·7	3·4	2·9	1·5
5.	♂	S.-G.	Sao Paulo, Brazil.	7·5	3·2	2·8	1·5
6.	—	S.-G.	Tilotilo, Yungas, Bol. (<i>Buckley</i>).	7·0	3·4	3·0	1·5
7.	—	S.-G.	Tilotilo, Yungas, Bol. (<i>Buckley</i>).	7·0	3·4	3·0	1·5

The figure (Plate XXXIV.) is taken from specimen No. 2.



H. H. Sclater del.

H. H. Sclater imp.

BUCCO STRIOLATUS

BUCCO STRIOLATUS.

THE STRIOLATED PUFF-BIRD.

PLATE XXXV.

Bucco (Capito) striolatus, Pelz. Sitz. Ak. Wien, xx. p. 509 (1856).

Nystalus striolatus, Cab. et Hein. Mus. Hein. iv. p. 140 (1863).

Bucco striolatus, Scl. Ex. Orn. p. 153, t. lxxvii (1869).

Bucco striolatus, Pelz. Orn. Bras. p. 22 (1871).

Bucco striolatus, Scl. et Salv. Nomencl. p. 106 (1873).

Suprà fusco-nigricans, plumis omnibus rufescenti marginatis et fasciatis; nuchâ latâ, capitis lateribus et torque pectorali saturatè ochraceis nigro punctatis et striolatis; loris et gulâ albicantibus; abdomine sericeo-albo, lateraliter fulvescenti tincto, ventre summo et hypochondriis nigro distinctè striolatis; subalaribus et remigum pogoniis interioribus ad basin cinnamomeis, caudâ totâ brunnescenti-nigrâ, rectricibus omnibus et in pogonio utroque ochraceo-rufo frequenter transfasciatis; rostro nigricante, tomis et mandibulæ basi flavicantibus; pedibus fuscis: long. tota 7·5, alæ 3·3, caudæ 3·1, rostri a rictu 1·6, tarsi 0·75. *Fem.* mari similis.

Hab. in Brasiliâ interiore, Boliviâ et Æquatoriâ orientali.

THIS Puff-bird is one of the many ornithological discoveries made by that prince of collectors, Johann Natterer, whose name I have so often referred to in this volume. During his travels in the province of Mato Grosso, in the interior of Brazil, Natterer passed four months (from July to October 1826) at the sugar-plantation of the then lately deceased Captain Gama. This plantation was situated about fifteen leagues from Villabella de Mato Grosso, either on the river Guaporé, or not far from its banks. Here and at the neighbouring station called "Dourado" eight specimens of the present *Bucco* were obtained, but lay unnoticed in the stores of the Imperial Cabinet at Vienna until they were described by Herr von Pelzeln in 1856.

The notes in Natterer's MS. journal, as published by Von Pelzeln, inform us that in this species the bill of the living bird is olive-green, with the end and the basal half of the culmen blackish brown. The iris he describes as dirty yellowish-white, the feet as olive-green, the tarsi rather brownish above, and the claws black. No details are given as to the habits of this bird; but, like the rest of its allies, it probably frequents the higher trees of the dense forest.

In 1869 Mr. Salvin and I gave a figure of this bird in our 'Exotic Ornithology' from a Nattererian skin obtained at Dourado on the 6th of July 1826, as shown by the label in the collector's own handwriting. It is marked female; but the sexes would be probably almost undistinguishable externally. The same example has been used for the illustration now given.

At the time Mr. Salvin and I figured this species Natterer was the only collector, so far as we knew, that had ever obtained it. But quite recently specimens of it have been received from two

other quarters. In the large series of bird-skins collected by Mr. C. Buckley in Eastern Ecuador, of which Mr. Salvin and I gave some account in the 'Proceedings' of the Zoological Society for March last*, were two examples of the present Puff-bird. These skins differ but slightly from the typical specimen, principally in having the head and upper back of a considerably darker hue. But the same difference is shown even more strongly in a specimen obtained by Mr. Buckley at Tilotilo, in the province of Yungas, in Bolivia; and I do not hesitate to refer both the Bolivian and Ecuadorian skins to *Bucco striolatus* of Von Pelzeln.

In its upper plumage generally *B. striolatus* closely resembles *B. chacuru*, and is of the same type of structure. But it may be readily distinguished by the long lineiform striolations on the lower surface, as well as by the dark bill.

The following are the dimensions of the four examples of *Bucco striolatus* now before me:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♀	P. L. S.	Mato Grosso (<i>Natterer</i>).	6·3	3·2	2·9	1·4
2.	—	S.-G.	Tilotilo, Yungas, Bol. (<i>Buckley</i>).	7·0	3·1	2·5	1·3
3.	—	P. L. S.	Sarayacu, Ecuador (<i>Buckley</i>).	7·2	3·2	2·7	1·4
4.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	7·0	3·2	2·8	1·4

* See P. Z. S. 1880, p. 155.



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BUCCO RADIATUS

BUCCO RADIATUS.

THE RADIATED PUFF-BIRD.

PLATE XXXVI.

Bucco radiatus, Scl. P. Z. S. 1853, p. 122, t. 50.

Bucco radiatus, Scl. Ann. N. H. ser. 2, xiii. p. 361 (1854).

Bucco radiatus, Scl. Syn. Bucc. p. 11 (1854).

Capito ruficervix, Bp. Consp. Vol. Zyg. p. 13 (1854).

Bucco radiatus, Scl. P. Z. S. 1855, p. 136.

Bucco radiatus, Scl. P. Z. S. 1855, p. 196.

Bucco radiatus, Scl. Cat. A. B. p. 271 (1862).

Nystalus radiatus, Cab. et Heine, Mus. Hein. iv. p. 141 (1863).

Bucco radiatus, Scl. et Salv. Nomencl. p. 106 (1873).

Bucco radiatus, Pelzeln, Ibis, 1875, p. 330.

Bucco radiatus, Scl. et Salv. P. Z. S. 1879, p. 536.

Suprà castaneus, nigro transversim radiatus; torque colli postici et capitis lateribus pallidè fulvis nigro fasciolatis; loris albidis; nuchâ et dorso summo nigricantioribus; subtùs albus aut ochraceo-albus, cervice anticâ, pectore et ventris lateribus fasciis transversis nigris occupatis; alis caudâque castaneis nigro regulariter transfasciatis; subalaribus et remigum pogoniis internis cinnamomeis plus minusve rufescentibus; rostro viridescenti-plumbeo, pedibus corylinis: long. tota 7·8, alæ 3·5, caudæ 2·9, rostri a rictu 1·4. *Fem.* mari similis.

Hab. in Æquatoriâ et in Columbiâ usque ad isthmum Panamensem.

ALTHOUGH many examples of this fine Puff-bird have been received in Europe of late years, and its range is apparently extensive, we have acquired absolutely no knowledge of its habits and mode of life. It may be assumed, I suppose, that in these respects it does not differ from other nearly allied members of the group; but precise information on this subject would be very desirable. In the meantime I must ask my readers to be content with a summary of the little that is known of its history.

I first acquired an example of this bird in 1847; but at that time I thought it might possibly be only an immature form of *Bucco chacuru*. In 1853, when collecting and examining materials for my 'Synopsis of the Bucconidæ,' I found other similar specimens in the British Museum, the study of which induced me to decide that the species was distinct and new to science; and I accordingly described and figured it in the 'Proceedings' of the Zoological Society for that year as *Bucco radiatus*, and subsequently inserted it in my 'Synopsis' under the same name. After this period little advance took place in our knowledge of this species until the late Mr. Salmon undertook his extensive researches into the ornithology of Antioquia, of which Mr. Salvin and I gave an account in the Zoological Society's 'Proceedings' for 1879. Mr. Salmon sent home in

his various collections many excellent skins of the present *Bucco*, which he met with in several localities during his excursions into the district surrounding Medellin—the capital city of the State of Antioquia.

It should be observed that the Antioquian skins of *Bucco radiatus*, one of which is faithfully represented in the larger figure of the accompanying Plate, differ from the typical specimens from Bogota (as represented in the hinder figure) in having the whole lower surface, except the chin, overspread with pale rufous or cinnamomeous, and the under wing-coverts also of a darker hue. It is possible, therefore, that the Antioquian bird may belong to a distinct local form, which some systematists would almost regard as entitled to a specific name; but I am by no means sure that this is the case. One of the four Bogota skins now before me belongs decidedly to the rufous-breasted form; and so does an imperfect skin from Eastern Ecuador, procured by Mr. Buckley near Sarayacu. It is evident, therefore, that the southern birds are not always of the pale-breasted variety. My conjecture is that the skins of the latter form may have been rendered paler by being damped in the process of manufacture, as I think I have observed in other “Bogota” skins. But I am not sure that this is the correct interpretation of the variation. That it is not of sexual origin seems evident from Mr. Salmon’s marked specimens.

From Antioquia *Bucco radiatus* extends northwards into the Panamanic isthmus; Mr. Salvin’s collector Arcé obtained specimens in Veragua.

From *B. chacuru* the present species may be at once distinguished by its lead-coloured bill and the transverse radiations of the undersurface, as well as by the entire absence of the large black blotches on the sides of the neck, which form one of the characteristic features of the latter species. From *B. striolatus*, to which it is, perhaps, even more closely allied, it may be recognized by the markings on the lower plumage being transverse instead of longitudinal.

There are fourteen examples of *Bucco radiatus* in my collection and that of Messrs. Salvin and Godman, namely:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Sarayacu, Ecuador (<i>Buckley</i>).	—	3·7	—	1·6
2.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	—	3·7	—	1·4
3.	—	S.-G.	Balzar Mountains, Ecuador.	7·0	3·5	2·9	1·6
4.	—	S.-G.	Balzar Mountains, Ecuador.	7·0	3·5	3·0	1·6
5.	—	S.-G.	Bogota.	7·0	3·4	2·8	1·3
6.	—	S.-G.	Bogota.	7·0	3·5	3·0	1·4
7.	—	P. L. S.	Bogota (1847).	7·8	3·5	2·9	1·4
8.	—	P. L. S.	Bogota.	7·4	3·7	3·0	1·5
9.	—	P. L. S.	Remedios, Antioquia (<i>Salmon</i>).	8·0	3·4	2·9	1·4
10.	♀	P. L. S.	Nichi, Antioquia (<i>Salmon</i>).	9·0	3·5	3·0	1·5
11.	♂	S.-G.	Nichi, Antioquia (<i>Salmon</i>).	8·5	3·3	2·9	1·5
12.	—	S.-G.	Remedios, Antioquia (<i>Salmon</i>).	8·0	3·3	3·3	1·5
13.	—	P. L. S.	Panama.	7·4	3·6	3·2	1·5
14.	—	S.-G.	Veragua (<i>Arcé</i>).	7·8	3·7	3·2	1·5

The figures and descriptions are taken from No. 7, the type of the original description, and No. 10.



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Hanhart 1897

MALACOPTILA FUSCA

MALACOPTILA FUSCA.

THE WHITE-BREASTED SOFT-WING.

PLATE XXXVII.

- White-breasted Barbet*, Lath. Syn. i. p. 505 (1782).
Bucco fuscus, Gm. S. N. i. p. 408 (1788).
Bucco fuscus, Lath. Ind. Orn. i. p. 206 (1790).
Le Tamatia brun, Levaill. Ois. de Par. ii. p. 99, t. 43 (1806).
Bucco fuscus, Vieill. Nouv. Dict. iii. p. 239 (1816).
White-breasted Barbet, Lath. G. H. iii. p. 219 (1822).
Bucco fuscus, Vieill. Enc. Méth. p. 1419 (1823).
Lypornix torquata (jun.), Wagl. Syst. Av. *Lypornix*, sp. 4 (1827).
Tamatia fusca, Less. Trait. d'Orn. p. 168 (1831).
Malacoptila fusca, Gray, List of Gen. B. p. 13 (1841).
Monasa fusca, Gray et Mitch. Gen. B. i. p. 74 (1846).
Monasa unitorques, DuBus, Bull. Ac. Brux. xiv. pt. 2, p. 107 (1847).
Monasa fusca, Gray, List of Fiss. B. M. p. 49 (1848).
Monasa unitorques, Lafr. Rev. Zool. 1848, p. 248.
Monasa fuscus, Bp. Consp. i. p. 147 (1850).
Monasa fusca, Strickl. Contr. to Orn. 1852, p. 43.
Malacoptila fusca, Scl. Ann. N. H. ser. 2, xiii. p. 474 (1854).
Malacoptila fusca, Scl. Syn. Bucc. p. 15 (1854).
Malacoptila fusca, Bp. Consp. Vol. Zyg. p. 13 (1854).
Malacoptila fusca, Scl. P. Z. S. 1855, p. 136, et p. 196.
Malacoptila inornata, Scl. P. Z. S. 1855, p. 195 (err.).
Malacoptila nigrifusca, Scl. P. Z. S. 1855, p. 195.
Monasa fusca, Pelz. Sitz. Ak. Wien, xx. p. 513 (1856).
Malacoptila unitorques, Scl. P. Z. S. 1858, p. 60.
Malacoptila fusca, Scl. Cat. A. B. p. 272, et
Malacoptila unitorques, Scl. ibid., et
Malacoptila nigrifusca, Scl. ibid. (1862).
Malacoptila fusca, Cab. et Heine, Mus. Hein. iv. p. 132, et
Malacoptila nigritorques, Cab. et Heine, ibid. (1863).
Malacoptila fusca, Scl. et Salv. P. Z. S. 1867, p. 583 et p. 752.
Monasa fusca, Pelz. Orn. Bras. p. 23 (1871).
Malacoptila fusca, Scl. et Salv. P. Z. S. 1873, p. 295.
Malacoptila fusca, Scl. et Salv. Nomencl. p. 106 (1873).

Suprà fusca, in pileo nigricantior, striis scapos plumarum occupantibus fulvis omninò variegata; loris albis; alis caudæque extùs immaculatis; subtùs dorso concolor sed dilutior, vittâ latâ subgutturali albâ, ventre medio fere albicante; remigum pogoniis internis basin versus albis; rostro corneo, ad basin flavicante! long. tota 6·3, alæ 3·5, caudæ rectr. med. 2·4, lat. 1·7, rostri a rictu 1·2. *Fem.* mari similis.

Hab. in Guianâ et Amazoniâ.

WE now leave the typical Puff-birds of the genus *Bucco*, which have hitherto occupied our attention, and proceed to consider the more aberrant members of the family, which constitute several distinct groups. The nearest of these to *Bucco* appears to be the form which Gray, in his second edition of his 'List of Genera' (1841), called *Malacoptila*, but which he afterwards reunited to *Monasa*. It embraces, according to the results I have arrived at, seven species.

The present species—the type of Gray's genus—was first described by Latham in 1782 as the "White-breasted Barbet," and "supposed to inhabit Cayenne, as it was in a parcel of birds from that place." The first scientific name, *Bucco fuscus*, was given to it six years later by Gmelin, and rests upon Latham's description.

In 1806 Levaillant figured the same bird, from examples received from Surinam, in his "Histoire Naturelle des Barbons," comprised in the second volume of his 'Oiseaux de Paradis,' as "*Le Tamatia brun*."

Under these designations the present bird remained known until 1827, when Wagler fell into the error of regarding it as the young stage of *Malacoptila torquata*, from which, I need hardly now say, it is totally distinct, and thus caused considerable confusion between the two species. This confusion prevailed more or less for the following twenty years, until it was cleared up by de Lafresnaye (Rev. Zool. 1848, p. 248) and Strickland, who published a special note on the subject in 'Contributions to Ornithology' for 1852*. It appears to have been the result of this confusion that in 1847 DuBus described specimens of this species from the Peruvian Amazons as new, under the title of *Monasa unitorques*, distinguishing it by this name from *M. torquata* (called by him *M. fusca*), which has two breast-bands. Since Lafresnaye and Strickland wrote upon the subject the perfect distinctness of *M. fusca* from *M. torquata* has been universally acknowledged.

In 1855 I proposed to separate the form of this species which occurs in collections from Bogotá as *M. nigrifusca*. I am, however, now of opinion that the differences of the Colombian form are not sufficient to establish specific individuality.

From Cayenne, Guiana, and Surinam, where it first became known to the older authors, *M. fusca* extends all over Amazonia to the Cisandean provinces of Colombia, Ecuador, and Peru. In Colombia, where some examples are remarkable for their darker colouring, it comes within the grasp of the Bogotá bird-hunters. In Ecuador it occurs on the Napo; and was obtained by Mr. Buckley at Sarayacu on the Bobanassa. On the Peruvian Amazons it was procured by Hauxwell at Chamicuros on the Huallaga, and by Edward Bartlett at the same spot and at Chyavetas. Natterer collected examples of it at Marabitanas, on the Rio Negro, and on the

* "On the Distinctness of *Monasa fusca* (Gm.) from *M. torquata* (Hahn)," Contr. to Orn. 1852, p. 43.

Rio Içanna, an upper confluent of the same stream. Natterer tells us that the iris is carmine, and the feet in life pale olive-green with the claws pale ochre-yellow. Natterer found it "solitary in the forest."

The following is a list of the examples of this Puff-bird in my collection and that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Cayenne.	6·5	3·5	2·5	1·2
2.	—	P. L. S.	Colombia.	6·5	3·6	2·4	1·2
3.	—	P. L. S.	Peruvian Amazons.	7·5	3·4	2·5	1·2
4.	♂	S.-G.	Chyavetas, P. A. (<i>Bartlett</i>).	6·7	3·4	2·4	1·2
5.	♂	P. L. S.	Chamicuros, Peru.	6·5	3·2	2·4	1·2
6.	—	P. L. S.	Sarayacu, Ecuador (<i>Buckley</i>).	6·4	3·4	2·4	1·2
7.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	6·5	3·3	2·4	1·2
8.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	6·7	3·6	2·5	1·2
9.	pull.	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	5·8	3·4	2·3	1·0

The figure (Plate XXXVII.) and description are taken from No. 5.



J. G. Keulemans lith

Hanhart imp

MALACOPTILA RUFA

MALACOPTILA RUFA.

THE RED SOFT-WING.

PLATE XXXVIII.

- Bucco rufus*, Spix, Av. Bras. i. p. 52, t. 40. fig. 1 (1824).
Lypornix rufa, Wagl. Syst. Av. *Lypornix*, sp. 5 (1827).
Bucco rufus, Hahn, Orn. Atl. *Bucco*, t. 4 (1841).
Capito senilis, Tsch. Faun. Per. Aves, p. 259 (1845-46).
Monasa rufa, Gray et Mitch. Gen. B. i. p. 74 (1846).
Monasa rufa, Gray, List of Fiss. B. M. p. 50 (1848).
Monasa rufus, Bp. Consp. i. p. 147 (1850).
Malacoptila rufa, Scl. Ann. N. H. ser. 2, xiii. p. 474 (1854).
Malacoptila rufa, Scl. Syn. Bucc. p. 15 (1854).
Scotocharis rufa, Bp. Consp. Vol. Zyg. p. 13 (1854).
Malacoptila rufa, Scl. P. Z. S. 1855, p. 196.
Monasa rufa, Pelz. Sitz. Ak. Wien, xx. p. 513 (1856).
Malacoptila rufa, Scl. Cat. A. B. p. 272 (1862).
Malacoptila rufa, Cab. et Heine, Mus. Hein. iv. p. 130 (1863).
Malacoptila rufa, Scl. et Salv. P. Z. S. 1867, p. 583.
Monasa rufa, Pelz. Orn. Bras. p. 23 (1871).
Malacoptila rufa, Scl. et Salv. Nomencl. p. 106 (1873).
Malacoptila rufa, Scl. et Salv. P. Z. S. 1873, p. 295.
Malacoptila rufa, Tacz. P. Z. S. 1874, p. 548.

Suprà brunnea; alis caudâque fuscis, illarum tectricibus extùs dorso concoloribus; pileo cinereo striis tenuibus albis ornato; fronte, capitis lateribus et cervice posticâ aurantiaco-rubris; subtùs pallidè fulva, in pectore rufescens, in ventre magis alba; vittâ pectorali latâ albâ infrà nigro obsoletè marginatâ; subalaribus et remigum marginibus internis albis; rostro obscurè corneo, ad basin mandibulæ inferioris flavicante, pedibus pallidè fuscis: long. tota 7·0, alæ 3·5, caudæ rectr. med. 2·6, ext. 2·0, rostri 1·2. *Fem.* mari similis.

Hab. in Amazoniâ inf. et sup.

LIKE the preceding, this very well-marked Soft-wing has a broad white breast-band, some of the lower feathers of which, however, show a faint indication of black margins, which remind one of the next following member of the genus. But the present species is immediately recognizable from both its allies by its cinereous cap, and by the brilliant orange-red of the front and sides of the head.

Spix first made this bird known to science. He described and figured it in 1824, in one of

the great works in which he made known the discoveries of his celebrated Brazilian journey, as *Bucco rufus*. Spix's name has been almost universally employed for the species since that date, the only exception I know being that Tschudi mentions it in the text of his 'Fauna Peruana' as "*Capito senilis*, Poeppig." But *Capito senilis* of Poeppig, based on specimens in the Leipsic Museum, obtained by that collector in the province of Maynas, Peru, is nothing more than the present species.

Spix gives the "forests of the Amazons" as the locality of this species, without further limitation. This is correct enough, as it certainly occurs both in Upper and Lower Amazonia. Natterer met with it near Pará in 1835; and Mr. Wallace obtained specimens in the same district in May 1849, one of which is in my collection. Natterer notes the iris as brown, and the legs and feet as olive-grey. In the preserved skins the latter are rather of a pale dirty brown. In the stomach Natterer found "remains of insects."

In Upper Amazonia *M. rufa* has been obtained by several travellers. Besides Poeppig, whom I have already mentioned in connexion with this species, Mr. E. Bartlett procured examples at Sarayacu on the Ucayali, and at Santa Cruz on the Huallaga, and Jelski at Monterico, in Central Peru. The last-mentioned collector records the colour of the iris as "rouge de sang"*.

The following is a list of the specimens of this species now before me:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♀	P. L. S.	Pará (<i>Wallace</i>).	6·6	3·5	2·6	1·1
2.	—	P. L. S.	Upper Amazons.	7·0	3·5	2·6	1·2
3.	—	S.-G.	Upper Amazons (<i>E. Bartlett</i>).	7·2	3·4	2·7	1·2

The figure (Plate XXXVIII.) and description are taken from No. 2.

* Taczanowski, P. Z. S. 1874, p. 548.



J. Sclater lith

Hanhart imp

MALACOPTILA TORQUATA

MALACOPTILA TORQUATA.

THE BANDED SOFT-WING.

PLATE XXXIX.

Bucco torquatus, Hahn u. Küster, Voeg. aus Asien, Lief. xiii. p. 2, t. 5 (1822).

Bucco fuscus, Licht. Verz. d. Doubl. p. 8 (1823).

Bucco striatus, Spix, Av. Bras. i. p. 52, t. xl. fig. 2 (1824).

Monasa fusca, Bp. Journ. Acad. Philadelph. iv. p. 370 (1825).

Lypornix torquata (adulta), Wagl. Syst. Av. *Lypornix*, sp. 4 (1827).

Capito fuscus, Max. Beitr. iv. p. 364 (1832).

Capito striatus, Dubois, Orn. Gal. p. 34, t. 22 (1839).

Lypornix striata, Sw. Orn. Dr. pl. 34 (1841).

Bucco striatus, Hahn, Orn. Atlas, *Bucco*, no. 5 (1841).

Monasa fusca (part.), Gray et Mitch. Gen. B. i. p. 74 (1846).

Monasa fusca, DuBus, Bull. Acad. Brux. xiv. pt. 2, p. 107 (1847).

Monasa fusca, Gray, List of Fiss. B. M. p. 49 (1848).

Monasa fuscus, Bp. Consp. i. p. 147 (1850).

Monasa torquata, Strickl. Contr. to Orn. 1852, p. 43.

Malacoptila torquata, Scl. Ann. N. H. ser. 2, xiii. p. 475 (1854).

Malacoptila torquata, Bp. Consp. Vol. Zyg. p. 13 (1854).

Malacoptila torquata, Scl. Syn. Bucc. p. 16 (1855).

Malacoptila torquata, Scl. P. Z. S. 1855, p. 196.

Monasa fusca, Burm. Syst. Ueb. ii. p. 290 (1856).

Monasa torquata, Pelz. Sitz. Ak. Wien, xx. p. 512 (1856).

Malacoptila torquata, Scl. Cat. A. B. p. 272 (1862).

Malacoptila torquata, Cab. et Heine, Mus. Hein. iv. p. 130 (1863).

Monasa torquata, Pelz. Orn. Bras. p. 23 (1871).

Malacoptila torquata, Scl. et Salv. Nomencl. p. 106 (1873).

Suprà fusca, in capite toto, dorso, et alarum tectricibus ferrugineo striata; loris rufis; plumis rictalibus albo rufoque variegatis; subtùs pallidè fulva; in gutture et pectore rufescens; vittâ latâ subgutturali niveâ, inde pectorali nigrâ; subalaribus et remigum marginibus internis rufis; rostro nigro, pedibus fuscis: long. tota 9·0, alæ 3·8, caudæ rectr. med. 3·9, ext. 2·8, rostri a rictu 1·3. *Fem.* mari similis, coloribus paulò dilutioribus.

Hab. in Brasiliæ merid. orient. regione sylvaticâ.

THE first account of this well-marked Brazilian species of Soft-wing was given in the thirteenth part of Hahn and Küster's 'Vögel aus Asien, Afrika, Amerika, und Neuholland,' published at
SCL. Jac. & Puffb. No. XVI.—July, 1881.

Nuremberg in 1822. Hahn and Küster's description and figure were taken from an example in the collection of Dr. John Wagler, the well-known naturalist, whose M.S. name, "*Bucco torquatus*," was adopted for the species.

In the following year (1823) Lichtenstein published short characters of this Soft-wing under the title *Bucco fuscus*, supposing it to be the bird described by previous authors under that name; and in 1824 it was again described and figured by Spix, in his 'Aves Brasilienses,' as *Bucco striatus*. Thus the unhappy bird had three different names assigned to it in three succeeding years, one of these names, moreover, properly appertaining to a different species. In 1827 Wagler continued the confusion by accurately describing the present bird and *M. fusca* as adult and young of the same species. This error prevailed more or less, as I have already stated, until 1852, when Strickland clearly pointed out the characters which separate the two allied species, and became not even quite extinct at that period, as Burmeister, in his 'Thiere Brasiliens,' failed to avoid it. But it is now universally acknowledged that the proper title of this species is *Malacoptila torquata*, and that *M. fusca* is quite distinct.

In the wood-region of South-eastern Brazil, where alone it is found, the Banded Soft-wing appears to have a tolerably wide distribution. It is common in collections of bird-skins received both from Bahia and from Rio; and Natterer obtained it at several of his collecting-stations in the more southern province of Sao Paulo. Prince Maximilian of Neuwied, still one of our best authorities on the birds of Brazil, tells us that he considers it one of the commonest forest-birds in Southern Brazil. Near Rio, in the neighbourhood of S. Cristoval, he found it in all the thick shady woods, even in the immediate vicinity of dwelling-houses. It sits upon a low twig or even upon the ground, and hops about to pick up insects, of which the remains are found in its stomach. The Prince always noticed this bird as being quite silent, and never heard it utter a sound. It is very tame and easy to shoot.

Dr. Burmeister found this Soft-wing, which, as already mentioned, he erroneously calls "*Monasa fusca*," the commonest of the family in those parts of Brazil which he visited. It comes into the village-gardens, and sits by the road-side without taking the least notice of what is going on around it. The impression made on a stranger by one of these curious birds is rather startling. It is seen at a distance through the thick forest with its white breast shining; and when one approaches it seems to stare at the traveller with its great open eyes as if it knew not what to do. Stupidity and simplicity are so evidently impressed upon it that the Brazilians naturally call it "Joao doido" (Silly John). Neither Dr. Burmeister nor Prince Maximilian of Neuwied were able to ascertain any thing of its nesting-habits.

The following is a list of the examples of these birds in my collection and that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Brazil.	9·0	3·8	3·9	1·3
2.	—	P. L. S.	Brazil.	7·7	3·7	3·5	1·2
3.	—	P. L. S.	Brazil.	7·5	3·8	3·5	1·2
4.	—	S.-G.	Bahia (<i>Wucherer</i>).	7·8	3·9	3·7	1·2
5.	—	S.-G.	Novo Fribourgo, B. (<i>Jouds</i>).	7·7	3·7	3·7	1·2
6.	—	S.-G.	Novo Fribourgo, B. (<i>Jouds</i>).	7·8	3·9	3·7	1·2

The figure (Plate XXXIX.) and description are taken from No. 1.



J.G. Keulemans lith.

Hartung imp

MALACOPTILA PANAMENSIS. ♂ et ♀.

MALACOPTILA PANAMENSIS.

THE WHITE-WHISKERED SOFT-WING.

PLATE XL.

- Malacoptila panamensis*, Lafr. Rev. Zool. 1847, p. 79.
Bucco panamensis, Gray et Mitch. Gen. B. iii. App. p. 4 (1849).
Capito panamensis, Bp. Consp. i. p. 146 (1850).
Malacoptila mystacalis, Lafr. Rev. Zool. 1850, p. 215, t. 3.
Malacoptila panamensis, Scl. P. Z. S. 1854, p. 123.
Malacoptila aspersa, Scl. Ann. Nat. Hist. ser. 2, xiii. p. 477, et
Malacoptila mystacalis, Scl. ibid.
Malacoptila panamensis, Scl. tom. cit. p. 478 (1854).
Malacoptila aspersa, Scl. Syn. Bucc. p. 17, et
Malacoptila mystacalis, Scl. op. cit. p. 18, et
Malacoptila panamensis, Scl. op. cit. p. 18 (1854).
Malacoptila panamensis, Scl. P. Z. S. 1855, p. 196.
Malacoptila aspersa, Scl. P. Z. S. 1855, p. 136 et p. 196.
Malacoptila mystacalis, Scl. P. Z. S. 1855, p. 136 et p. 196.
Chaunornis panamensis, Bp. Consp. Vol. Zyg. p. 13 (1855).
Malacoptila panamensis, Scl. P. Z. S. 1860, p. 297.
Malacoptila panamensis, Cassin, Proc. Acad. Philad. 1860, p. 134.
Malacoptila poliopis, Scl. P. Z. S. 1862, p. 86, pl. viii. (♀).
Malacoptila panamensis, Scl. Cat. A. B. p. 273, et
Malacoptila poliopis, Scl. ibid., et
Malacoptila mystacalis, Scl. ibid. (1862).
Malacoptila æquatorialis, Cab. et Heine, Mus. Hein. iv. p. 134, et
Malacoptila panamensis, Cab. et Heine, tom. cit., et
Malacoptila costaricensis, Cab. et Heine, tom. cit. p. 135, et
Malacoptila poliopis, Cab. et Heine, tom. cit. p. 136, et
Malacoptila aspersa, Cab. et Heine, tom. cit. p. 137, et
Malacoptila mystacalis, Cab. et Heine, tom. cit. p. 138, et
Malacoptila blacica, Cab. et Heine, tom. cit. p. 137 (1863).
Malacoptila panamensis, Scl. et Salv. P. Z. S. 1864, p. 363, et
Malacoptila inornata, Scl. et Salv. ibid.
Malacoptila panamensis, Salvin, P. Z. S. 1870, p. 201.
Malacoptila panamensis, Scl. et Salv. Nomencl. p. 106, et
Malacoptila mystacalis, Scl. et Salv. ibid. (1873).

Malacoptila mystacalis, Scl. et Salv. P. Z. S. 1875, p. 237.

Malacoptila panamensis, Tacz. P. Z. S. 1877, p. 333.

Malacoptila panamensis, Boucard, P. Z. S. 1878, p. 47.

Malacoptila panamensis, Scl. et Salv. P. Z. S. 1879, p. 536.

Suprà fusca ferrugineo lavata, in dorso et alis extùs pallido fulvo punctata; loris et plumis rictalibus albo variegatis; gulâ anticâ et pectore ferrugineis, ventre albo, in parte superiore fusco flammulato, lateribus ferrugineo variegatis; subalaribus et remigum marginibus interioribus pallidè ferrugineis; rostro corneo, ad basin flavicante; pedibus fuscis. *Fem.* colore notæi fuscescenti-cinereo et pectore valdè dilutior diversâ.

Hab. in Costâ Ricâ, isthmo Panamensi, Columbiâ et Venezuelâ interiore, et in Æquatoriâ et Peruviâ occidentali.

THE first three species of the present genus are well marked in their distinctive characters, are confined to certain limited geographical areas, and show little, if any, difference in the plumage of the sexes. The species which we now come to, as is frequently the case even in the most natural genera, seems to be just the opposite to its preceding relatives as regards all these circumstances. It is so unstable in its characters that five or six species have been based upon its different races; it has a wide range in Central and Southern America; and its sexes are dissimilar enough in plumage to have been referred to different species. It has taken me some time to convince myself that the birds described by various authors under the six specific names above given must be referred to one species; but a careful study of the subject has resulted in leaving me no alternative. The only doubt I have is whether I am quite justified in regarding the more northern form, *M. inornata*, which is figured on Plate XLI., as really distinct.

The earliest name given to the present bird, and therefore to be adopted for the species in all parts of its distribution, is *Malacoptila panamensis*, under which Lafresnaye in 1847 described, in the 'Revue Zoologique,' specimens obtained by the well-known French collector Delattre on the isthmus of Panama. Lafresnaye's description is in every point applicable to the male of this species, of which numerous examples have since been received from the same locality. His types are now, I suppose, in the Museum of the Academy of Natural Sciences of Philadelphia, along with the other birds purchased in Europe by the late Mr. Thomas B. Wilson for that institution.

Three years later Lafresnaye described and figured the Colombian form of this bird, in the same periodical, as *Malacoptila mystacalis*. Such Bogotá skins of this species as have come under my notice certainly show a more well-marked white forehead and more perfectly white moustache than is usual in Panama examples of the same bird; and even up to the time of the compilation of the 'Nomenclator' Mr. Salvin and I had continued to regard them as distinct, whilst we had come to the conclusion that the forms of Central America and Western Ecuador were inseparable*. But in Mr. Salmon's Antioquian series there are some specimens which

* Cf. P. Z. S. 1870, p. 201.

present similar characters to the Bogotá skins, whilst others cannot be separated from the Panama form. Again, in some Costa-Rican skins I find the white lores and moustaches well developed. I must therefore cease to consider these marks as differential characters, and must unite *M. mystacalis* to *M. panamensis*.

The next name assigned to the present species was *M. aspersa*, under which, in the Zoological Society's 'Proceedings' for 1854, I described a specimen in the British Museum said to have been received from Caraccas. I am now of opinion that this bird is merely a female of *M. panamensis*, and that even the locality is not quite trustworthy, as many of Dyson's Nicaraguan specimens, sold through the late Mr. Hugh Cuming, were erroneously attributed to Caraccas*.

The present species, therefore, in my 'Synopsis of the Bucconidæ,' published in 1854, was, as I now believe, given under three names—*M. panamensis*, *M. mystacalis*, and *M. aspersa*. To these four others have been added since that period, all of which, according to my present views, I am inclined to think must also be united to *M. panamensis*. I will say a few words about each of these names.

In 1862 I based my *M. poliopsis* upon two pale-backed and less rufous-throated birds obtained by Fraser at Esmeraldas in Ecuador. These specimens, which are still in my cabinet, I now refer to the female of *M. panamensis*.

In 1863, in their account of the Bucconidæ, published in the fourth part of the 'Museum Heineanum,' Messrs. Cabanis and Heine based a *M. æquatorialis* upon one of Fraser's duplicates from Esmeraldas. I have five examples of Fraser's from the same locality, but I find it impossible to distinguish them from others obtained on the Panamanic isthmus.

In the same work the same authors proposed to separate a Costa-Rican example of this species in the Berlin Museum as *M. costaricensis*. I have not, it is true, had the advantage of examining this specimen; but, after comparing eight Costa-Rican skins of this Soft-wing now before me with the Panama series, I see no ground for separating them, although one of the Costa-Rican specimens comes very near to the northern form *M. inornata*.

As regards *M. blacica*, described in the same work, and based on a single specimen obtained in "Peru" by Warcewicz, I have come to a similar conclusion. Messrs. Cabanis and Heine admit that it is "very nearly allied" to *M. mystacalis*, and only distinguishable by the greyish olive-brown colour of the upper plumage and generally paler colour below. This, I think, may well be attributed to merely sexual variation; and M. Taczanowski has already referred specimens obtained by Jelski and Stolzmann in North-western Peru to *M. panamensis*†.

On the whole, therefore, I think *M. panamensis* must be regarded as a widely spread and somewhat variable species, which extends from Costa Rica through the isthmus down to Western Peru on the one side, and through the interior of Colombia to the Andes of Merida on the other. The specimens from Esmeraldas, figured on Plate XL. (the male in front and the female behind) I regard as fair examples of the prevailing type. But there is much individual

* E. g. *Myctes palliatus* and *Sciurus dorsalis*, Gray, P. Z. S. 1848, p. 138.

† See P. Z. S. 1877, p. 333.

variation in the amount of white on the lores, front, and moustaches, in the depth of rufous tinge of the back and tail, and in the strength of the flammulations of the belly. And these variations are certainly not strictly local, being observable in some individuals from the same district.

The following series of thirty-five specimens of this Soft-wing belonging to my own collection and that of Messrs. Salvin and Godman is that upon which I have based the previous observations. I have arranged them according to their localities, beginning at the north, and put at the head of each set the name which it would be entitled to bear if regarded as specifically distinct.

(*M. costaricensis*.)

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♂	S.-G.	Costa Rica (<i>Carmioli</i>).	7·3	3·4	3·0	1·3
2.	♀	P. L. S.	Costa Rica (<i>Carmioli</i>).	7·7	3·5	3·5	1·1
3.	♂	S.-G.	Tucurriqui, C. R. (<i>Arcé</i>).	6·8	3·4	3·0	1·2
4.	♀	S.-G.	Tucurriqui, C. R. (<i>Arcé</i>).	7·0	3·3	3·2	1·1
5.	pull.	S.-G.	Tucurriqui, C. R. (<i>Arcé</i>).	4·8	2·9	1·6	0·9
6.	pull.	S.-G.	Tucurriqui, C. R. (<i>Arcé</i>).	4·8	2·8	1·5	0·9
7.	♀	S.-G.	Dota, C. R. (<i>Carmioli</i>).	7·5	3·4	3·1	1·3
8.	♀	S.-G.	Peje, C. R. (<i>Carmioli</i>).	7·6	3·4	3·2	1·2

(*M. panamensis*.)

9.	♂	P. L. S.	Chiriqui (<i>Arcé</i>).	7·0	3·2	3·0	1·3
10.	♀	P. L. S.	Chiriqui (<i>Arcé</i>).	7·0	3·3	3·1	1·3
11.	♂	S.-G.	Bugaba, Chiriqui (<i>Arcé</i>).	6·7	3·2	2·8	1·2
12.	♀	S.-G.	Bugaba, Chiriqui (<i>Arcé</i>).	6·7	3·4	3·0	1·2
13.	♂	S.-G.	Chorcha, Chiriqui (<i>Arcé</i>).	6·6	3·3	3·0	1·1
14.	♀	S.-G.	Chorcha, Chiriqui (<i>Arcé</i>).	7·1	3·3	3·0	1·2
15.	♂	S.-G.	Vole. of Chiriqui (<i>Arcé</i>).	6·6	3·3	3·0	1·2
16.	♂	S.-G.	Panama (<i>M'Leannan</i>).	6·8	3·3	2·8	1·2
17.	♂	S.-G.	Panama (<i>M'Leannan</i>).	7·2	3·4	2·8	1·3
18.	♂	S.-G.	Panama (<i>M'Leannan</i>).	6·8	3·4	2·7	1·2
19.	♀	S.-G.	Panama (<i>M'Leannan</i>).	7·2	3·4	2·9	1·3
20.	♀	S.-G.	Panama (<i>M'Leannan</i>).	7·2	3·4	3·2	1·2

(*M. mystacalis*.)

21.	♂	P. L. S.	Antioquia (<i>Salmon</i>).	8·4	3·7	3·7	1·3
22.	♂	P. L. S.	Remedios, Ant. (<i>Salmon</i>).	7·5	3·3	3·0	1·2
23.	♀	P. L. S.	Remedios, Ant. (<i>Salmon</i>).	7·3	3·4	2·9	1·2
24.	♂	S.-G.	Nichi, Ant. (<i>Salmon</i>).	7·6	3·4	3·0	1·2
25.	♂	P. L. S.	Bogota.	7·2	3·8	3·6	1·1
26.	♂	S.-G.	Bogota.	7·6	3·7	3·6	1·3
27.	♂	P. L. S.	San Cristobal, Venezuela (<i>Goering</i>).	8·2	3·7	3·5	1·2

(M. æquatorialis.)

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
28.	♂	S.-G.	Balzar Mount., Ecuador (<i>Illingworth</i>).	6·3	3·3	3·0	1·2
29.	♂	S.-G.	Balzar Mount., Ecuador (<i>Illingworth</i>).	6·3	3·3	3·2	1·2
30.	♂	P. L. S.	Esmeraldas, Ecuador (<i>Fraser</i>).	7·0	3·3	3·0	1·1
31.	♂	P. L. S.	Esmeraldas, Ecuador (<i>Fraser</i>).	7·0	3·3	2·9	1·1
32.	♂	P. L. S.	Esmeraldas, Ecuador (<i>Fraser</i>).	7·2	3·4	2·9	1·3
33.	♂	P. L. S.	Esmeraldas, Ecuador (<i>Fraser</i>).	7·4	3·5	3·0	1·2
34.	♀	P. L. S.	Esmeraldas, Ecuador (<i>Fraser</i>).	7·0	3·5	2·8	1·2
35.	♀	P. L. S.	Esmeraldas, Ecuador (<i>Fraser</i>).	7·0	3·5	2·8	1·1

The front figure of Plate XL. is taken from No. 33, the hinder one from No. 35. Nos. 34 and 35 are the types of my *M. poliopis*.



J. G. Keulemans lith

Hanhart. imp.

MALACOPTILA INORNATA. ♂ et ♀.

MALACOPTILA INORNATA.

THE GUATEMALAN SOFT-WING.

PLATE XLI.

Monasa inornata, DuBus, Bull. Acad. Brux. xiv. pt. 2, p. 107 (1847).

Monasa inornata, Lafr. Rev. Zool. 1848, p. 249.

Monasa inornata, Gray et Mitch. Gen. B. iii. App. p. 4 (1849).

Monasa inornata, Bp. Consp. i. p. 147 (1850).

Malacoptila inornata, Scl. Ann. N. H. ser. 2, xiii. p. 478 (1854).

Malacoptila inornata, Scl. Syn. Bucc. p. 19 (1854).

Malacoptila inornata, Scl. P. Z. S. 1855, p. 196.

Malacoptila inornata, Scl. et Salv. Ibis, 1860, p. 40.

Malacoptila veræ-pacis, Scl. et Salv. Ibis, 1860, p. 40.

Malacoptila inornata, Scl. Cat. A. B. p. 273, et

Malacoptila veræ-pacis, Scl. ibid. (1862).

Malacoptila inornata, Cab. et Hein. Mus. Hein. iv. p. 137, et

Malacoptila veræ-pacis, Cab. et Hein. ibid. p. 139 (1863).

Malacoptila inornata, Salvin, P. Z. S. 1870, p. 201.

Malacoptila inornata, Scl. et Salv. Nomencl. p. 106 (1873).

Suprà ferruginea, pileo fuscescentiore; pileo, interscapulio, et alis extùs maculis triquetris fulvis variegatis; fronte, loris et plumis rictalibus plus minusve albo mixtis; subtùs valdè dilutior, fulvescens, ferrugineo lavata, in pectoris lateribus fusco obsoletè flammulata; ventre medio albicantiore; subalaribus et remigum marginibus internis lætè ferrugineis; rostro corneo, ad basin flavicante; pedibus fuscis: long. tota 7·0, alæ 3·4, caudæ rectr. med. 3·2, lat. 2·2, rostri a rictu 1·2. *Fem.* colore notæi cineraceo, gastræi albicante diversa; pectore medio fulvo, ventre fusco obsoletè flammulato; subalaribus et remigum marginibus internis cinnamomeis; caudâ rufescente unicolori.

Hab. in Guatemalâ.

I HAVE already expressed the doubt I feel as to the propriety of maintaining this form as distinct from the preceding species; but, after going fully into the subject again, I think it best to adhere to the decision at which, in conjunction with Mr. Salvin, I arrived in 1870, after examination of the large series contained in our two collections together. Mr. Salvin has so clearly put this forward in his article "On the Birds of Veragua," published in the Zoological Society's 'Proceedings' for that year, that I cannot do better than copy what he has said upon the question:—

"In the northern form, for which the term *inornata* is the oldest and must be adopted, the male is distinguishable by the rufous colouring extending nearly uniformly over the whole surface below, being slightly paler on the lower belly, and bearing very slight traces of dark

markings on the margins of the feathers. In the southern form, for which the name *panamensis* must be retained, the breast alone is clear ferruginous, and is succeeded below by strongly mottled plumage, formed by the black lateral margins of each feather; the lower belly is pale fulvous, nearly white. These characters are still more strongly marked in the specimens from Western Ecuador in Sclater's collection. The females of the two forms are so exactly alike that it is not possible to distinguish them"*.

Mr. Salvin did not meet with these birds himself during his several journeys to Guatemala. He tells me, however, that they appear to occur only in the warmer forests of Northern Vera Paz, at an elevation above the sea-level not exceeding 2000 feet. Numerous specimens were obtained by his Indian collectors in the woods round the native settlements called Choctum and Chisec in the upper valley of the Rio de la Pasion, where these and other birds are killed by the blow-pipe, which is generally used in that district.

The name *inornata* was conferred on the Guatemalan Soft-wing by M. le Vicomte B. DuBus, in a paper on some new species of American Birds in the Royal Museum of Natural History of Brussels, read before the Belgian Academy on August 7th, 1847, and subsequently published in the 'Bulletin' of the Academy. The specimen described by the author appears to have been a female. In 1860 Mr. Salvin and I, in our joint paper on the ornithology of Guatemala, described what we now believe to be the male of the same species as *Malacoptila veræ-pacis*.

So far as we know, *Malacoptila inornata* is restricted to Guatemala. From Honduras I have not yet seen examples of this form; so I cannot tell whether they belong to *M. inornata* or *M. panamensis*. The Costa-Rican specimens must, I think, be referred rather to the latter species, although some of them are slightly intermediate.

The following list enumerates the examples of this Soft-wing in my collection and that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♂	P. L. S.	Choctum, Vera Paz (<i>O. S.</i>).	7·0	3·4	3·1	1·2
2.	♂ jr.	P. L. S.	Guatemala.	7·0	3·2	3·2	1·1
3.	♀	P. L. S.	Choctum, Vera Paz (<i>O. S.</i>).	7·4	3·4	3·3	1·2
4.	♀	P. L. S.	Guatemala (<i>O. S.</i>).	6·8	3·3	3·1	1·2
5.	♂	S.-G.	Choctum, Vera Paz (<i>O. S.</i> , 1861).	7·0	3·3	3·1	1·1
6.	♂	S.-G.	Guatemala (<i>O. S.</i>).	7·0	3·3	3·1	1·2
7.	♂	S.-G.	Coban, Vera Paz (<i>Constancia</i>).	7·2	3·4	3·1	1·1
8.	♀	S.-G.	Guatemala (<i>O. S.</i>).	7·8	3·3	3·5	1·3
9.	♀	S.-G.	Choctum, V. P. (<i>O. S.</i> , 1862).	7·0	3·4	3·2	1·2
10.	♀	S.-G.	Chisec, V. P. (<i>O. S.</i> , 1861).	7·5	3·3	3·2	1·1
11.	♀	S.-G.	Vera Paz (<i>O. S.</i> , 1864).	7·5	3·4	3·2	1·2

The figures (Plate XLI.) are taken from Nos. 1 and 4. No. 7 is the type of *M. veræ-pacis*.

* Salvin in P. Z. S. 1870, p. 201.



MALACOPTILA FULVIGULARIS.

THE BROWN-THROATED SOFT-WING.

PLATE XLII.

"*Lypornix rufa*, Wagl.," Tsch. Faun. Per., Aves, pp. 41, 257 (1844-46).

Malacoptila fulvogularis, Scl. P. Z. S. 1853, p. 123.

Malacoptila fulvogularis, Scl. Ann. N. H. ser. 2, xiii. p. 476 (1854).

Malacoptila fulvogularis, Scl. Syn. Bucc. p. 16 (1854).

Malacoptila pyrrholæma, Bp. Consp. Vol. Zyg. p. 13 (1854).

Malacoptila fulvigularis, Scl. P. Z. S. 1855, p. 196.

Malacoptila fulvigularis, Cab. et Hein. Mus. Hein. iv. p. 131 (1863).

Malacoptila fulvogularis, Scl. Nomencl. p. 106 (1873).

Malacoptila fulvogularis, Scl. et Salv. P. Z. S. 1879, p. 633.

Suprà fusca colore pallidiore variegata; capite toto, dorso superiore, et cervicis lateribus nigricantibus, striis scapas plumarum occupantibus albis ornatis; plumis rictalibus albo variegatis; loris et gutture toto fulvis; pectore et lateribus nigris, striis similibus albis sed latioribus ornatis; ventre imo et crisso fulvescenti-albidis; subalaribus et remigum marginibus interioribus pallidè fulvis; caudâ totâ fuscescenti-cineraceâ, subtùs dilutiore: long. tota 7·2, alæ 3·9, caudæ rectr. med. 3·9, lat. 2·5, rostri 1·2.

Hab. in Bolivia et Peruvia reg. sylv. orientali.

THE late Mr. Thomas Bridges, Corresponding Member of the Zoological Society of London, was long well known as a most successful and enterprising collector of animals, and an excellent observer of their habits. *Octodon bridgesi* amongst the mammals, and *Drymornis bridgesi* amongst the birds, commemorate his name as regards the two classes to which he paid special attention, and are the more appropriately termed, as he was the original discoverer of both of them.

The specimens collected by Mr. Bridges in 1841 and the following years in the republics of Chili and Bolivia passed mostly into the collection of the British Museum and into that of the then Earl of Derby, a most munificent patron of zoology. Unfortunately no pains were taken to record their localities correctly, and too often we find examples actually obtained in one of these countries credited to the other. Nor were the specimens obtained by Mr. Bridges ever worked out; so that many species actually first discovered by him were subsequently described from examples obtained by later investigators.

It was from one of Mr. Bridges's specimens, originally in the Knowsley collection, but after the death of Lord Derby removed, along with the rest of the collection, to Liverpool, that I described this species in 1853, when I was collecting materials for my 'Synopsis of the Bucconidæ.' At the time of the publication of that work I had seen but the single example of

it above mentioned; and I have met with but few others since that period. One of these I subsequently found in the Museum of Neuchâtel, labelled "*Lypornix rufa*, Wagl.," and marked as one of Tschudi's original specimens. And on referring to Tschudi's description in the 'Fauna Peruana,' it is quite evident that the species described by Tschudi under that name was the present bird, and not the *Lypornix rufa* of Wagler (*i. e.* our *Malacoptila rufa*), to which Tschudi referred it.

I also find by my notes that *Malacoptila pyrrholæma*, a name published by Bonaparte in his 'Conspectus Volucrum Zygodactylorum' in 1854, without any description, was based on an example of the present species*. I believe that the specimen at the time I examined it was in the possession of MM. Verreaux frères, the well-known Parisian dealers.

The only other example of *M. fulvigularis* which I have met with is in the collection of Messrs. Salvin and Godman, and forms the subject of the accompanying plate (Plate XLII.). It was obtained at Tilotilo, a group of ranchos situated on a spur of the Bolivian Andes which separates the Rio de la Paz and the Rio Coroico, two small upper confluent of the Beni, by Mr. Clarence Buckley in 1876.

As regards the colour of its upper surface, *M. fulvigularis* agrees with *M. torquata* and *M. fusca* in having the head and upper back longitudinally striated by light shaft-stripes upon a dark ground. But it is readily distinguishable from both these species by its fulvous throat, which extends up to the mentum, and is in fact very distinct from every other member of the genus, except the next following species, *M. substriata*. I shall point out the characters which distinguish these two representative species in my next article.

* Cf. Bonaparte, "Consp. Vol. Anisodactylorum" in 'Ateneo Italiano,' No. 11, August 1854.



J.G. Keulemans lith.

Hartart imp.

MALACOPTILA SUBSTRIATA

MALACOPTILA SUBSTRIATA.

THE SUBSTRIATED SOFT-WING.

PLATE XLIII.

Malacoptila substriata, Scl. P. Z. S. 1853, p. 123, t. li.

Malacoptila substriata, Scl. Ann. N. H. ser. 2, xiii. p. 476 (1854).

Malacoptila substriata, Scl. Syn. Bucc. p. 17 (1854).

Malacoptila substriata, Scl. P. Z. S. 1855, p. 136 et p. 196.

Malacoptila substriata, Scl. Cat. A. B. p. 273 (1862).

Malacoptila substriata, Cab. et Heine, Mus. Hein. iv. p. 134 (1863).

Malacoptila substriata, Scl. et Salv. Nomencl. p. 106 (1873).

Suprà fusca, colore pallidiorie variegata; pileo antico et capitis lateribus obscurioribus, striis angustis elongatis, plumarum scapoc occupantibus, fulvescenti-albidis occupatis; loris et plumis rictalibus albo variegatis; mento et gutture toto fulvis; pectore et lateribus sicut in capite sed latiùs albo striatis; ventre medio et crisso albido et fulvo mixtis; subalaribus et remigum marginibus interioribus pallidè cinnamomeis; caudâ rufescenti-fuscâ unicolori, subtùs paulo dilutiore: long. tota 7·0, alæ 3·6, caudæ rectr. med. 3·8, ext. 3·5, rostri 1·1.

Hab. in Columbiâ int.

I DESCRIBED and figured this Soft-wing in 1853 from a single "Bogotá" skin in my own collection, which I had purchased of Argent, the well-known dealer, formerly of Bishopsgate Street. In the following year, when I issued my 'Synopsis of the Bucconidæ,' this was the only example I had seen of it; but a few years later I secured a second specimen out of a large series of Bogotá skins which came into the hands of Mr. Jamrach for disposal. These two examples, of both of which I am still the fortunate owner, are the only individuals I have yet met with of this scarce species.

Now that I have had the opportunity of comparing these two skins with an example of *M. fulvicularis*, I must acknowledge that the two forms are not separated by differences of a very decided character, and that it is even possible that they may be identical. Yet I am unwilling to unite them without the evidence of a more extended series, as there are many parallel instances of Bolivian and Peruvian forms being replaced in the north by representative species.

Comparing the specimens now before me together, the following differences may be noted. The shaft-stripes on the head of *M. fulvicularis* are whiter and better-defined, and extend down to the middle of the back; in *M. substriata* they cease at the nape in one specimen, and hardly reach so far in the other. The same variation, as is well shown by the Plate, is still more noticeable on the lower surface of the two allies. In *M. fulvicularis* the pectoral flammulations

are much broader, more clearly white, and more distinct, and the belly and crissum are white instead of pale fulvous. It is quite possible, as I have already suggested, that these differences may disappear when a larger series of the two forms shall have been compared, or when examples from the intervening districts shall have been obtained; but for the present, I think, *M. substriata* must be retained as an apparently different representative species.

I have no exact knowledge, I regret to say, of the exact district in which my skins of *M. substriata* were procured. Bogotá collections notoriously contain examples of the inhabitants of two very different wood-regions—that of the valleys drained by the Magdalena, and that of the southern slopes of the Colombian Andes, besides specimens from the treeless plains round the capital itself. I should suppose, however, that the present bird is an inhabitant of the more southern wood-region, although if such be the case we might have expected it to occur also in collections from Eastern Ecuador. Here, however, so far as I am aware, it has not yet been noticed.

The figure (Plate XLIII.) is taken from the second specimen of this species which I acquired, not from the original type, which has already been figured in the Zoological Society's 'Proceedings' for 1853 (Aves, pl. li.).

The typical example is rather a longer skin than that now figured, being of a different "make," and shows more decided white on the lores, front, and rictal bristles. Otherwise it is scarcely different.



J.G. Keulemans lith

Hanhart imp

MICROMONACHA LANCEOLATA

MICROMONACHA LANCEOLATA.

THE LANCEOLATED MONKLET.

PLATE XLIV.

Bucco lanceolata, Deville, Rev. et Mag. de Zool. 1849, p. 56.

Bucco lanceolatus, Scl. Ann. N. H. ser. 2, xiii. p. 363 (1854).

Bucco lanceolatus, Scl. Syn. Bucc. p. 13, pl. 3 (1854).

Capito lanceolatus, Bp. Consp. Vol. Zyg. p. 13 (1854).

Bucco lanceolatus, Scl. P. Z. S. 1855, p. 196.

Capito lanceolatus, Des Murs, An. nouveaux ou rares del Exp. de Castelnau, Ois. p. 30.

Nystalus lanceolatus, Cab. et Heine, Mus. Hein. iv. p. 142 (1863).

Bucco lanceolatus, Scl. et Salv. Nomencl. p. 106 (1873).

Micromonacha lanceolata, Scl. P. Z. S. 1881, June 21st.

Suprà rufescenti-brunnea, interscapulii et uropygii plumis quibusdam fulvo subtilissimè marginatis; loris et plumis frontalibus albis, vittâ angustâ nigrâ a pileo disjunctis; subtùs alba, striis nigris ornata; crisso rufescente; caudâ suprà rufescente, subtùs magis cineraceâ, fasciâ submarginali e maculis subquadratis nigris compositâ instructâ; subalaribus et remigum marginibus internis albis; rostro nigro, pedibus pallidè virescenti-fuscis: long. tota 4·9, alæ 2·5, caudæ rectr. med. 1·8, ext. 1·5, rostri 1·0.

Hab. in Amazoniâ superiore.

THIS well-marked and peculiar Puff-bird was discovered on the Ucayali during the descent of that river by M. de Castelnau and his companions in the course of their adventurous return-journey across South America from Lima to Pará, and was first described by M. Deville, who accompanied the party as zoological collector, in 1849. M. Deville gives nothing but a bare description of the species, together with the information that it was found near Sarayacu, in the Pampa del Sacramento; nor are any further details added by Des Murs in the 'Ornithology' of Castelnau's voyage.

In my 'Synopsis of the Bucconidæ,' published in 1854, I gave a figure of this species, taken from the typical example in the French national collection. At that time the only other example of it I had met with was a single specimen in Sir William Jardine's collection, received along with other birds from the Rio Napo through Prof. Jameson of Quito.

Up to a very recent period, so far as I know, nothing more was added to the history of the present bird. But on overhauling the extensive collection formed in Western Ecuador by Mr. Clarence Buckley in 1876 and the following years, Mr. Salvin and I had the pleasure of finding, amongst many other rarities, four examples of this scarce species, obtained near Sarayacu, an Indian village of about forty houses on the Bobonassa—a locality which must not be confounded with the Peruvian Sarayacu on the Ucayali above mentioned. Mr. Buckley

kindly informs me that he did not himself shoot this bird, but that his specimens were brought to him in the flesh killed by the blow-pipe by the Indians of Sarayacu. The bird is found in the shady nooks of the forests in pairs, sitting on the small dried branches near the ground. Its food is moths and other insects. It is very tame; and it is easy to approach them even within a few yards distance.

M. Deville placed the present bird in the genus *Bucco*; and in my 'Synopsis' I did not suggest any alteration, although fully aware that it was an aberrant species. I had some thoughts, however, of removing it into the adjoining genus *Malacoptila*; here would be perhaps a more appropriate situation for this singular species; but I have convinced myself, after a mature examination, that it would be not quite a natural one. On the whole, as I have stated at a recent meeting of the Zoological Society, it seems necessary to give it an independent status as the type of a new genus to be placed between *Malacoptila* and *Nonnula*, differing from the former by its short tail, and from the latter by its shorter and stronger bill. In general style of colour *Micromonacha lanceolata*, as I propose to call it, is also conspicuously different from all other members of the family.

The following is a list of the specimens of this species in my own collection and that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Sarayacu, Ecuador (<i>Buckley</i>).	4·9	2·5	1·8	1·0
2.	—	P. L. S.	Sarayacu, Ecuador (<i>Buckley</i>).	4·7	2·5	1·7	1·0
3.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	4·9	2·5	1·7	1·0
4.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	4·8	2·5	1·7	1·0

These four examples are very nearly similar. The figure (Plate XLIV.) is taken from No. 1.



Nonnula cin.

Hankart imp

1. NONNULA RUBECULA
2. NONNULA CINERACEA

NONNULA RUBECULA.

THE RED-BREASTED NUNLET.

PLATE XLV. FIG. 1.

- Bucco rubecula*, Spix, Av. Bras. i. p. 51, t. 39. fig. 1 (1824).
Monaca phaioleucos, Temm. Pl. Col. 323. fig. 2 (1825).
Lypornix rubecula, Wagl. Syst. Av. *Lypornix*, sp. 6 (1827).
"Cuculus rufalbinus, Temm.," Cuv. Règn. An. i. p. 455 (1829).
Monasa rubecula, Less. Tr. d'Orn. p. 157 (1831).
Monasa phaioleucos, Temm. Tabl. Méth. p. 55 (1836).
Lypornix rubicula, Sw. B. Brazil, t. 35 (1841).
Monasa rubecula, Gray et Mitch. Gen. B. i. p. 74 (1846).
Monasa rubecula, Gray, List of Fiss. B. M. p. 50 (1848).
Monasa rubecula, Bp. Consp. i. p. 147 (1850).
Nonnula rubecula, Scl. P. Z. S. 1853, p. 124.
Malacoptila rubecula, Scl. Ann. N. H. ser. 2, xiii. p. 479 (1854).
Malacoptila rubecula, Scl. Syn. Bucc. p. 19 (1854).
Scotocharis rubecula, Bp. Consp. Vol. Zyg. p. 13 (1854).
Nonnula rubecula, Scl. P. Z. S. 1855, p. 196.
Monasa rubecula, Burm. Syst. Ueb. ii. p. 292 (1856).
Monasa rubecula, Pelz. Sitz. Ak. Wien, xx. p. 512 (1856).
Nonnula rubecula, Scl. Cat. A. B. p. 273 (1862).
Nonnula rubecula, Cab. et Heine, Mus. Hein. iv. p. 129 (1863).
Monasa rubecula, Reinh. Fuglef. Bras. Camp. p. 121 (1870).
Monasa rubecula, Pelz. Orn. Bras. p. 23 (1871).
Nonnula rubecula, Scl. et Salv. Nomencl. p. 106 (1873).

Suprà brunnea, in pileo magis cineracea, in alis et caudâ obscurior; loris, mento et oculorum ambitu albis; subtùs pallidè fulva, in pectore clarior, ferè rufescens; ventre medio albo; subalaribus et remigum marginibus internis pallidè cinnamomeis: long. tota 5·5, alæ 2·5, caudæ rectr. med. 2·4, lat. 1·9, rostri a rictu 0·9. Fem. mari similis.

Hab. in Brasiliæ orientalis regione sylvaticâ et in Amazoniâ inferiore.

THE genus *Nonnula*, which we now proceed to consider, embraces the smallest and most delicate members of the family Bucconidæ. Until 1853 the known species of this group were usually united to *Monasa* or *Malacoptila*, to the latter of which they are undoubtedly very closely allied. But in that year I proposed, in a communication made to the Zoological Society of London, to constitute them a distinct genus under the name "*Nonnula*" (a diminutive of "*Nonna*," a "Nun"), a term which I now render into English as "Nunlet."

SCL. JAC. & PUFFB. No. XVIII.—November, 1881.

The Nunlets as yet known to us belong to four species, divisible into two sections, in the former of which the lores are white, while in the latter these parts are grey or brown. We will commence with the best-known member of the former section.

Spix, one of the earliest scientific explorers of the rich fauna of Tropical America, was the original discoverer and describer of the Red-breasted Nunlet, which he appropriately named "*rubecula*," after our well-known European favourite. Spix, in his great work on the Birds of Brazil, tells us that he met with this bird near the village of Malhada, on the Rio San Francisco. This would appear to be about the centre of its range, as it occurs in other widely separated provinces of Brazil, both to the north and to the south of that river.

Going first to the south, we find from Herr von Pelzeln's account of Natterer's collections that it was obtained by that indefatigable explorer at Ypanema, in the province of Sao Paulo, and near Goiaz, the capital of the province of the same name. Prince Maximilian of Neuwied does not appear to have noticed it during his travels in South-eastern Brazil; but Burmeister procured a single specimen of it near New Freiburg, in Minas Geraes, and Reinhardt records its occurrence near Lagoa Santa. It was also, there is little doubt, from this part of Brazil that Temminck and Swainson obtained the specimens which they figured, although neither of them has favoured us with exact information on the subject. Temminck's name for the species, it may be remarked, was published a year later than that of Spix, and must therefore give way to Spix's appropriate appellation.

Turning now to the north, we find that Natterer obtained examples of *Nonnula rubecula* at Borba on the Rio Madeira, at Marabitanas on the Rio Negro, and on the Rio Içanna. Our well-known countryman Mr. A. R. Wallace likewise procured specimens on the Lower Amazons; so that there can be little doubt of its pervading this district, although it is not usual to find the same species common to Lower Amazonia and the wood-region of South-eastern Brazil.

As regards the habits of the present bird we have unfortunately very little information. Professor Burmeister's hunters told him that it is found solitary in the forests, and resembles *Malacoptila fusca* in its mode of life. Natterer's notes tell us that the sexes are alike, that the iris is dark brown, and that the eye-ring is black, bordered with a row of small white featherlets.

This species certainly seems to be scarce; for during thirty-five years' collecting I have never succeeded in getting but one example of it; and for the preparation of this article I have only two examples before me, which measure as follows:—

No.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	P. L. S.	Pará (?).	5·5	2·5	2·4	0·9
2.	S.-G.	Bahia (<i>Wucherer</i>).	5·0	2·4	2·2	0·9

The figure (Plate XLV. fig. 1) is taken from No. 1.

NONNULA CINERACEA.

THE ASHY NUNLET.

PLATE XLV. FIG. 2.

Nonnula cineracea, Sclater, P. Z. S. 1881, p. 778.

Suprà cineracea, dorso, alis extùs et caudâ obscurioribus; loris et ciliis oculorum albis; subtùs pallidè fulva, ventre crissoque albis; subalaribus et remigum marginibus internis pallidè cinnamomeis; rostro obscurè plumbeo, ad basin flavicante; pedibus plumbeis: long. tota 5·0, alæ 2·6, caudæ 2·1, rostri a rictu 1·0.

Hab. in Amazoniâ superiore.

Obs. Species *N. rubecula* proxima, sed colore dorsi cineraceo, et pectoris valdè dilutius distinguenda.

A SINGLE specimen of this species in the British Museum is marked *Nonnula frontalis* in the handwriting of the late Mr. G. R. Gray. I do not, however, consider it can possibly be referred to that species. The skin in question was received from Mr. Bates through Mr. S. Stevens in 1853, and, as Mr. Bates has kindly informed me, was one of a series obtained by him at Ega from a French collector who had been up the Rio Javari. It is labelled "Iris châtain, bec bleu."

It is always somewhat hazardous to base a species upon a single example; but on the whole I think there can be little doubt that in this case it is the only course to be followed. The alternative is to consider the typical specimen of *N. cineracea* an aberrant example of *N. rubecula*; but, passing over the points of difference mentioned above, it must be recollected that *N. rubecula* is not known to occur at all in the Upper-Amazonian district, and that, besides, there are numerous instances of Lower-Amazonian forms being replaced in Upper Amazonia by distinct representative species. In the present instance I have little doubt that it is a case of this sort with which we are dealing, and that future researches in the forests of Eastern Peru will confirm the distinctness of this finer and larger form of *N. rubecula*.

N. cineracea, I may remark, is the only species of the family Bucconidæ of which neither my own collection nor that of my friends Messrs. Salvin and Godman can furnish a specimen. My figure is therefore taken from the typical and unique example in the British Museum.



70 X 100 mm. 1/2 in.

Hanhart imp

1 NONNULA RUFICAPILLA
2 NONNULA BRUNNEA.

NONNULA RUFICAPILLA.

THE RED-CAPPED NUNLET.

PLATE XLVI. FIG. 1.

- Lypornix ruficapilla*, Tsch. Wieg. Arch. 1844, pt. i. p. 300.
Lypornix ruficapilla, Tsch. Faun. Per. Aves, p. 258, t. 24. fig. 1 (1845).
Monasa ruficapilla, Gray et Mitch. Gen. B. i. p. 74 (1846).
Monasa ruficapillus, Bp. Consp. i. p. 147 (1850).
Malacoptila ruficapilla, Scl. Ann. N. H. ser. 2, xiii. p. 480 (1854).
Malacoptila ruficapilla, Scl. Syn. Bucc. p. 20 (1854).
Scotocharis ruficapilla, Bp. Consp. Vol. Zyg. p. 13 (1854).
Nonnula ruficapilla, Scl. P. Z. S. 1855, p. 196.
Monasa ruficapilla, Pelz. Sitz. Akad. Wien, xx. p. 512 (1856).
Nonnula ruficapilla, Scl. Cat. A. B. p. 274 (1862).
Nonnula ruficapilla, Cab. et Heine, Mus. Hein. iv. p. 130 (1863).
Nonnula ruficapilla, Scl. et Salv. P. Z. S. 1866, p. 192.
Monasa ruficapilla, Pelz. Orn. Bras. p. 23 (1871).
Nonnula ruficapilla, Scl. et Salv. P. Z. S. 1873, p. 295.
Nonnula ruficapilla, Scl. et Salv. Nomencl. p. 106 (1873).
Nonnula ruficapilla, Tacz. P. Z. S. 1874, p. 548.

Suprà brunnea; pileo castaneo; lateribus capitis et cervice posticâ cinereis; subtus medialiter ferrugineo-rufa, ventre dilutiore, crisso albo, lateribus in cinereum transeuntibus; subalaribus et remigum marginibus internis cinnamomeis: long. tota 5·7, alæ 2·4, caudæ 2·2, rostri a rictu 1·0. *Fem.* mari similis.

Hab. in Peruvîâ orientali et in Brasiliâ interiore ad fines Boliviae.

DR. J. J. VON TSCHUDI, one of the first explorers of the zoological riches of the Peruvian Republic, was the discoverer of this Nunlet, of which he has given us an unmistakable, if not very elegant, figure in his 'Fauna Peruana.' But little information, however, is presented to us concerning it in the pages of that not very satisfactory work. We are merely told that, in common with the allied species of the family, it was met with on the low bushes at the edges of the forests in the eastern wood-region of Peru, and was rather rare. In other parts of the great Amazonian wood-region *N. ruficapilla* has also been obtained by Hauxwell and Edward Bartlett on the river Ucayali, and by Jelski at Amable Maria, in Central Peru. But it seems that the present bird likewise occurs in another far-distant locality, where one would hardly have expected to meet with it.

In his excellent volume upon the ornithological results of Natterer's travels in South America, Herr von Pelzeln tells us that that distinguished explorer collected ten examples of

Nonnula ruficapilla. These were obtained at three places in the Brazilian province of Mato Grosso, adjoining the Bolivian frontier—namely Villa Maria, Engenho do Cap. Gama, and Ponte do Guaporé. Villa Maria lies on the upper waters of the Paraguay: Engenho do Cap. Gama (the sugar-mill of Captain Gama) and Ponte do Guaporé (the bridge over the Guaporé) are situated near together on the Rio Guaporé, a confluent of the Madeira, about fifteen leagues below Villa Bella de Matogrosso. One of the skins procured by Natterer at the first of these three stations, and which is now in my cabinet, fully agrees with Upper-Amazonian specimens. There can therefore be no doubt, I think, that *Nonnula ruficapilla* occurs in these two widely separated localities; and the probability is, of course, that it will hereafter be discovered to exist in the intermediate region, wherever the soil and vegetation are suitable to its existence.

Natterer found this species solitary in the forest, sitting on branches near the ground. He describes the iris as dark brown in both sexes, the feet dark brownish grey, and claws black.

The following is a list of the specimens in my collection:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♀	P. L. S.	Villa Maria, Matogrosso (<i>Natterer</i>).	5·0	2·3	2·4	1·0
2.	—	P. L. S.	River Ucayali (<i>E. Bartlett</i>).	5·7	2·4	2·2	1·0
3.	—	P. L. S.	Eastern Peru.	5·3	2·2	2·1	1·1

The figure (Plate XLVI. fig. 2) is taken from No. 2.

NONNULA FRONTALIS.

THE BROWN-CAPPED NUNLET.

Malacoptila frontalis, Scl. Ann. N. H. ser. 2, xiii. p. 479 (1854).

Malacoptila frontalis, Scl. Syn. Bucc. p. 20 (1854).

Malacoptila frontalis, Scl. P. Z. S. 1855, p. 136.

Nonnula frontalis, Scl. P. Z. S. 1855, p. 196.

Nonnula frontalis, Scl. P. Z. S. 1858, p. 60.

Malacoptila frontalis, Lawr. Ann. Lyc. N. Y. vii. p. 318 (1861).

Nonnula frontalis, Scl. Cat. A. B. p. 274 (1862).

Nonnula frontalis, Cab. et Heine, Mus. Hein. iv. p. 129 (1863).

Nonnula frontalis, Scl. et Salv. Nomen. p. 106 (1873).

Suprà brunnea, pileo rufescente in dorsi colorem transeunte; loris et regione oculari cinereis; subtùs ferrugineo-rufa, ventre dilutiore, crisso albo; remigibus et rectricibus nigricantibus, harum extimis utrinque cinereo marginatis; subalaribus et remigum marginibus internis cinnamomeis: long. tota 5·7, alæ 2·3, caudæ 2·4, rostri a rictu 1·0.

Hab. in Columbiâ interiore et in isthmo Panamensi.

THIS bird seems to be a northern form of *Nonnula ruficapilla*; and I have lately even had some doubts as to the propriety of continuing to regard it as a distinct species. But upon the whole I have decided for the present to maintain its independent existence, although I have not thought it necessary to give a figure of it. Before the question can be finally settled a better series of specimens must be examined than that which I have had before me.

Nonnula frontalis was first described in 1855 in my 'Synopsis of the Bucconidæ,' and based upon "Bogota" skins in the British Museum. The only other locality in which I am aware of its occurrence is the Isthmus of Panama. Mr. Lawrence recorded its existence in this district in 1861 from examples procured by Mr. McCleannan on the Panama Railway. The collection of Messrs. Salvin and Godman also contains a single skin received from the same zealous collector.

As is also noticed under the head of *N. brunnea*, two of the specimens referred to the present species in my 'Catalogue of American Birds' properly belong to the following member of the genus.

Comparing *N. frontalis* with *N. ruficapilla* we may note the following differences. The cap, instead of being of a bright chestnut, well defined, is of a brownish colour. There is no

cinereous on the sides of the head and nape cutting off the cap from the back, but the brownish cap passes gradually into the less bright brown of the upper surface.

The three examples of *N. frontalis* now before me measure as follows:—

No.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	P. L. S.	Columbia interior.	5·0	2·3	2·4	1·0
2.	S.-G.	Columbia interior.	5·7	2·4	2·2	1·0
3.	S.-G.	Panama (<i>McCleannan</i>).	5·3	2·3	2·1	1·1

NONNULA BRUNNEA.

THE BROWN NUNLET.

PLATE XLVI. FIG. 2.

Nonnula frontalis, Scl. et Salv. P. Z. S. 1866, p. 192.

Nonnula frontalis, Scl. et Salv. P. Z. S. 1867, p. 752.

Nonnula frontalis, Scl. et Salv. P. Z. S. 1873, p. 295.

Nonnula brunnea, Selater, Ibis, 1881, p. 600.

Suprà brunnea, ferè unicolor, loris subrufescentibus; alis et caudâ nigricantibus, secundariorum et tectricum marginibus extûs dorso concoloribus, rectricum externarum apicibus et ceterarum marginibus angustis rufescentibus; subtûs ferruginea, lateraliter obscurior, in ventre crissoque magis cinnamomea; subalaribus et remigum marginibus internis ventri concoloribus; rostro nigricanti-plumbeo, mandibulâ inferiore ad basin flavicante; pedibus pallidè fuscis: long. tota 5·5, alæ 2·5, caudæ 2·3, rostri a rictu 1·1. *Fem.* mari similis.

Hab. in Æquatoriâ, Columbiâ interiore et Peruviâ orientali.

“BOGOTA” skins, as they are commonly called, have several merits in the eyes of the collector. They are cheap and abundant, and have such a peculiar “make” that it is always easy to recognize them. On the other hand, they are distorted to an extreme, the wings and tails being pushed up into the bodies, the heads drawn in, and the whole skin being compressed together into the smallest possible space. It is consequently not always easy to separate two closely allied forms when both of them occur within the range of the Bogota bird-hunters, as the case of the present species will show.

I acquired two “Bogota” examples of the present Puff-bird in 1854, shortly after the publication of my ‘Synopsis,’ but unwittingly referred them to *N. frontalis*, not supposing that there was likely to be a second species in the same locality, and registered them as such in my ‘Catalogue of American Birds.’ This error led Mr. Salvin and myself into the further mistake of assigning several examples of *N. brunnea* procured by Mr. E. Bartlett at various stations on the Upper Amazons (Chyavetas, Chamicuros and Santa Cruz) to *N. frontalis*. It was not, therefore, until quite recently, when I began to study Mr. C. Buckley’s excellent specimens of the present species procured at Sarayacu in Ecuador, that I discovered the truth and proceeded to describe *N. brunnea* as an independent species.

I believe, however, that the present bird is fully entitled to specific rank, being really more distinct from *N. ruficapilla* than is *N. frontalis*. Its area seems to embrace the wood-regions of Eastern Peru and Ecuador, and to extend northwards into the borders of Colombia south of the Andes, whence the Bogota collectors no doubt procure their specimens.

SCL. Jac. & Puffb. No. XIX.—November, 1881.

The recent collection made by Herr Stolzmann for the Warsaw Museum contains an example of this species procured at Yurimaguas.

I add a list of the specimens of *N. brunnea* in my collection and that of Messrs. Salvin and Godman.

No.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	P. L. S.	Columbia interior.	5·0	2·3	2·2	1·0
2.	P. L. S.	Columbia interior.	5·0	2·2	2·1	1·0
3.	S.-G.	Columbia interior.	4·8	2·5	2·1	1·1
4.	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	5·3	2·5	2·3	1·1
5.	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	5·7	2·6	2·3	1·1
6.	P. L. S.	Sarayacu, Ecuador (<i>Buckley</i>).	5·5	2·5	2·3	1·1

The figure (Plate XLVI. fig. 2) is taken from No. 6.



J. G. Koudemans del.

Hanhart imp.

HAPALOPTILA CASTANEA.

HAPALOPTILA CASTANEA.

THE CHESTNUT SLENDERWING.

PLATE XLVII.

Malacoptila castanea, Verreaux, Rev. de Zool. xviii. p. 355, t. xix. (1866).

Malacoptila castanea, Scl. et Salv. Nomencl. p. 106 (1873).

Malacoptila castanea, Scl. et Salv. P. Z. S. 1879, p. 536.

Hapaloptila castanea, Scl. P. Z. S. 1881, p. 777.

Suprà cinerea, olivaceo adumbrata, alis caudâque extûs fusco-nigricantibus; fronte latè albâ fasciâ angustâ nigrâ posticè cinctâ; subtûs castanea, mento albo; subalaribus et remigum marginibus internis ventri concoloribus; rostro et pedibus nigris: long. tota 9·0, alæ 4·2, caudæ rect. med. 3·7, ext. 2·7, rostri a rictu 1·7. *Fem.* mari similis.

Hab. in Æquatoriâ et Columbiâ interiore.

THE present species, one of the largest and most striking forms of the whole group of Puff-birds, was referred by its describer to *Malacoptila*; but in general structure it seems to be more nearly akin to *Monacha*. I have therefore arranged it next to that genus, under the new title *Hapaloptila*, which I proposed for it at a recent meeting of the Zoological Society of London.

Very little, I regret to say, is known of this fine bird; and until quite recently its exact *patria* was a matter of some doubt. Jules Verreaux based his description upon a single example in the collection of the late Count Ercole Turati of Milan, stated to have been received from Bogota; but I have never met with an example of it among the many thousands of "Bogota" skins which have passed under my observation. A more certain locality is the Andean valleys in the vicinity of Quito, several skins of it having occurred in the more recent arrivals from that district. But within these last few years our doubts as to the origin of *Hapaloptila castanea* have been set at rest by two excellent collectors, who have themselves obtained examples of it in its native wilds. The late Mr. T. K. Salmon, whose name I have so often already mentioned in these pages, met with this bird near Frontino, in the Colombian State of Antioquia; and Mr. C. Buckley, a not less energetic and successful explorer of the South-American forests, procured specimens near Imtag, in Western Ecuador. There is no longer any question, therefore, that the area of this fine species extends from the forests of Western Colombia into those of the adjoining State of Ecuador.

The subjoined table gives the localities and measurements of the eight examples of this species in my collection and in that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Antioquia (<i>Salmon</i>).	10·5	4·1	3·6	1·9
2.	♀	S.-G.	Antioquia (<i>Salmon</i>).	10·0	4·2	4·0	1·8
3.	—	S.-G.	Imtag, Ecuador (<i>Buckley</i>).	9·2	4·1	3·8	1·8
4.	—	S.-G.	Imtag, Ecuador (<i>Buckley</i>).	9·2	4·1	3·7	1·8
5.	—	P. L. S.	Ecuador.	9·0	4·2	3·7	1·7
6.	—	S.-G.	Ecuador.	8·8	4·3	3·8	1·7
7.	—	S.-G.	Ecuador.	9·0	4·3	3·8	1·8
8.	—	S.-G.	Ecuador.	8·9	4·4	3·8	1·7

The figure (Plate XLVII.) is taken from No. 5.



MONACHA NIGRA

MONACHA NIGRA.
THE WHITE-WINGED NUNBIRD.

PLATE XLVIII.

- Cuculus niger*, P. L. S. Müller, Suppl. Linn. Natursyst. p. 90 (1776).
Coucou noir de Cayenne, Daub. Pl. Enl. 512.
Coucou noir de Cayenne, Buff. Hist. Nat. vi. p. 476 (1780).
Cuculus ater, Bodd. Tabl. d. Pl. Enl. p. 30 (1783).
Corvus australis, Gm. Syst. Nat. i. p. 377, et
Bucco cinereus, Gm. ibid. p. 409, et
Cuculus tranquillus, Gm. ibid. p. 417 (1788).
Bucco calcaratus, Lath. Ind. Orn. i. p. 206 (1790).
Le Barbacou à bec rouge, Levaill. Ois. de Par. ii. p. 103, tt. 44, 45 (1806).
Corvus affinis, Shaw, Gen. Zool. vii. p. 381 (1809).
Monasa tranquilla, Vieill. Nouv. Dict. xxi. p. 321 (1818).
Wax-billed Barbet, Lath. Gen. Hist. iii. p. 232 (1822).
Monasa tranquilla, Vieill. Enc. Méth. p. 1338 (1823).
Bucco cinereus, Licht. Verz. d. Doubl. p. 8 (1823).
Lyppornix tranquilla, Wagl. Syst. Av. *Lyppornix*, sp. 1 (1827).
Monasa tranquilla, Less. Tr. d'Orn. p. 157 (1831).
Monasa atra, Gray et Mitch. Gen. B. i. p. 74 (1846).
Monasa tranquilla, Cab. in Schomb. Guian. iii. p. 719 (1848).
Monasa atra, Gray, List of Fiss. B. M. p. 49 (1848).
Monasa tranquillus, Bp. Consp. i. p. 147 (1850).
Monasa atra, ScL. Ann. N. H. ser. 2, xiii. p. 480 (1854).
Monasa tranquilla, Bp. Consp. Vol. Zyg. p. 13 (1854).
Monasa atra, ScL. Syn. Bucc. p. 21 (1854).
Monasa atra, ScL. P. Z. S. 1855, p. 196.
Monasa atra, Pelz. Sitz. Ak. Wien, xx. p. 511 (1856).
Monasa atra, Cassin, Pr. Acad. Sc. Phil. 1860, p. 135.
Monasa atra, ScL. Cat. A. B. p. 274 (1862).
Monasa atra, Cab. et Hein. Mus. Hein. iv. p. 126 (1863).
Monasa atra, Pelz. Orn. Bras. p. 22 (1871).
Monasa atra, ScL. et Salv. Nomencl. p. 106 (1873).

Suprà nigra; campterio alari et tectricum marginibus externis albis; subtùs paulo dilutior in cinereum trahens; subalaribus albis, remigum pogoniis internis cineraceis; rostro ruberrimo; pedibus nigris: long. tota 10·5, alæ 4·7, caudæ 2·0, rectr. med. 4·7, ext. 3·9, rostri a rictu 1·7. *Fem.* mari similis.

Hab. in Guianâ, Cayennâ et in ripis fl. Nigræ.

THE White-winged Nunbird was one of the first South-American birds known to scientific naturalists. Although not included in Linnæus's 'Systema Naturæ,' it was described by Buffon and Latham, and figured by Daubenton and Levaillant. As regards its correct classical name there has unfortunately been some diversity of opinion. The specific term *tranquilla* (one of three given to it by Gmelin in 1788) was generally adopted until G. R. Gray made the unhappy discovery that Boddaert's scientific names for the species figured in the 'Planches Enluménées' had been published two years previously to the issue of Gmelin's work. Thenceforward Boddaert's "*atra*" took its place. But Boddaert's name was in its turn superseded when Cassin in 1864* called attention to the existence of P. L. S. Müller's supplementary volume to his edition of the 'Systema Naturæ,' and showed that Müller's names published in 1776 were strictly entitled to recognition. It seems, therefore, that "*Monacha nigra* (P. L. S. Müller)" is the proper title of this species for those who follow the Stricklandian code of nomenclature.

The older authors give us but few details concerning this bird. It may be worth while, however, to extract the following passage from Levaillant's article on it:—

"L'espèce du Barbacou à bec rouge habite la Guyane française et hollandaise: il est fort commun à Cayenne, d'où on l'a expédié en si grand nombre en Europe qu'il n'est presque pas un cabinet dans cette partie du monde où on ne le trouve. Cinq individus de cette même espèce, apportés de Surinam dans le tafia, où ils étoient restés trente-sept ans lorsque je les en retirai pour en faire la dissection et en reconnoître les sexes, n'avoient que peu perdu de l'éclat du rouge de leur bec; ce qui prouve encore combien cette couleur est profondément gravée dans la matière cornée de cette partie de l'oiseau, tandis qu'elle s'efface si vite chez les autres. J'espère qu'on ne sera pas tenté d'attribuer au climat de la Guyane cette ténacité, puisqu'il est dans le même pays d'autres oiseaux à bec rouge chez lesquels cette couleur s'efface très promptement."

The only writer of modern days who has made acquaintance with *Monacha atra* in the Guianan wilds is Schomburgk. He tells us that this species is always met with in pairs, which prefer the less dense forests and the trees on the banks of the rivers. He always observed them on trees, and not on bushes. Their food is insects, which they capture in flight. Of their breeding-habits he could obtain no information. The Warau Indians call this bird "Horatepara," the Macusis "Warapischuro."

Like most of the other best-known forms of Cayenne, the White-winged Nunbird extends into the interior as far as the forests of the Rio Negro. In this district the celebrated Natterer collected eighteen specimens during his travels on the Rio Negro and Rio Branco in 1830 and the succeeding years. As quoted by V. Pelzeln, he described in his MS. journal the iris of this species as "dark brown, feet and claws blackish grey, the tarsi on their upper surface passing into violet."

I have also examined specimens of this species from Angostura, on the Orinoco, in the Museum of Kiel, and from Para or its vicinity in the Museum of Berlin. Examples collected by Castelnau and Deville near Barra in February 1847 are in the Paris Museum. In the same collection are likewise three skins of this bird received among a large series forwarded to the Jardin des Plantes from Guayaquil by M. Wiener. Unless, therefore, there has been some error in this case, it would seem that *M. nigra* reappears in the western coast-region of Ecuador.

* See "Fasti Ornithologiæ," by John Cassin, Proc. Acad. Nat. Sc. Phil. 1864, p. 234.

The white marginations of the wing-coverts at once render this Nunbird distinguishable from the other members of the genus. The next following species, *Monacha flavirostris*, comes nearest to it, but may be at once recognizable by its smaller size and yellow bill.

I conclude with a list of the examples of *Monacha atra* in my collection and in that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Brit. Guiana (<i>Brown</i>).	10·5	4·7	4·7	1·7
2.	♂	P. L. S.	Maroni, Brit. Guiana (<i>Whitely</i>).	10·5	5·0	4·10	1·7
3.	—	P. L. S.	Cayenne.	11·5	5·2	5·2	1·7
4.	—	S.-G.	Oyapok, Cayenne (<i>Verdey</i>).	11·4	5·0	4·6	1·7
5.	—	S.-G.	Amazons.	11·8	5·1	5·1	1·8

The figure (Plate XLVIII.) is taken from No. 1.



J.G. Keulemans

Hanhart imp

MONACHA FLAVIROSTRIS

MONACHA FLAVIROSTRIS.

THE YELLOW-BILLED NUNBIRD.

PLATE XLIX.

Monasa flavirostris, Strickl. Contr. Orn. 1850, p. 47, t. 48.

Monasa axillaris, Lafr. Rev. de Zool. 1850, p. 216.

Monasa flavirostris, Scl. Ann. N. H. ser. 2, xiii. p. 481 (1854).

Monasa flavirostris, Scl. Syn. Bucc. p. 21 (1854).

Monasa flavirostris, Scl. P. Z. S. 1855, pp. 136, 196.

Monasa axillaris, Cassin, Pr. Acad. Phil. 1860, p. 135.

Monasa flavirostris, Scl. Cat. A. B. p. 274 (1862).

Monasa flavirostris, Cab. et Heine, Mus. Hein. iv. p. 127 (1863).

Monasa flavirostris, Scl. et Salv. P. Z. S. 1867, p. 752.

Monasa flavirostris, Scl. et Salv. P. Z. S. 1873, p. 295.

Monasa flavirostris, Scl. et Salv. Nomencl. p. 106 (1873).

Saturatè nigra unicolor, alis caudâque æneo tinctis; campterio et subalaribus albis; remigum marginibus internis dilutè cineraceis; rostro flavo; pedibus nigris: long. tota 7·9, alæ 4·2, caudæ 4·0, rostri 1·1.
Fem. mari similis.

Hab. in Columbiâ interiore et in Amazoniâ superiore.

THE smaller dimensions and yellow bill of the present species at once distinguish it from all its fellows, and render it easily recognizable. In structure, however, it does not deviate from the typical form of *Monacha*.

The Yellow-billed Nunbird first became known to science in 1850, from specimens received from Upper Amazonia. These were described about the same time by Strickland in this country and by Lafresnaye in France, under different names. But the appropriate term *flavirostris*, assigned to it by the former author, appears to have had a slight priority, and has been generally adopted for this species.

The only exact localities I am acquainted with for this Nunbird in Upper Amazonia are Chyavitas, a small town situated on one of the lower spurs of the Andes west of the Huallaga, where Mr. Edward Bartlett obtained examples in 1867, and Sarayacu, in Ecuador, where Mr. Clarence Buckley collected specimens in 1879.

But it is evident that *Monacha flavirostris* extends on further northward than Western Ecuador, as it comes within the grasp of the Bogota' bird-hunters. It may be presumed, however, that it does not cross the great range into the valleys draining the further slope, but

that the skins of the well-known "Bogota" make are procured on the south side of the Colombian Andes, on the affluents of the Amazons or Orinoco.

The series of this species in the collection of Messrs. Salvin and Godman and in my own cabinet consists of the following examples:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Colombia interior.	7·1	4·3	3·9	1·2
2.	—	P. L. S.	Colombia interior.	7·9	4·2	4·0	1·1
3.	—	S.-G.	Colombia interior.	8·4	4·4	4·2	1·3
4.	—	P. L. S.	Sarayacu, Ecuador (<i>Buckley</i>).	7·2	4·2	3·9	1·1
5.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	8·5	4·4	4·0	1·3
6.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	8·4	4·3	3·9	1·3
7.	♀	S.-G.	Chyavitas, Peru (<i>Bartlett</i>).	9·2	4·4	4·0	1·3

The figure (Plate XLIX.) is taken from No. 3.



J. G. Koenig, del.

Hanhart imp

MONACHA MORPHEUS

MONACHA MORPHEUS.

THE WHITE-FACED NUNBIRD.

PLATE L.

-
- White-faced Barbet*, Latham, Gen. Hist. iii. p. 233 (1822).
Bucco morphoeus, Hahn u. Küster, Vögel aus Asien, Lief. xiv. p. 1, t. 2 (1822).
Monasa personata, Vieill. Gal. d. Ois. i. p. 23, t. 36 (1823).
Monasa personata, Vieill. Enc. Méth. p. 1339 (1823).
Bucco leucops, Licht. Verz. d. Doubl. p. 8 (1823).
Bucco albifrons, Spix, Av. Bras. p. 53, t. 41 (1824).
Lypornix leucops, Wagl. Syst. Av. *Lypornix*, sp. 3 (1827).
Monasa personata, Less. Tr. d'Orn. p. 157 (1831).
Capito leucops, Wied, Beitr. iv. p. 368 (1832).
Tamatia leucops, Sw. B. of Brazil, t. 12 (1841).
Monasa leucops, Gray et Mitch. Gen. B. i. p. 74 (1846).
Monasa leucops, Gray, List of Fiss. B. M. p. 49 (1848).
Monasa leucops, Bp. Consp. i. p. 147 (1850).
Monasa personata, Scl. Ann. N. H. ser. 2, xiii. p. 481 (1854).
Monasa personata, Scl. Syn. Bucc. p. 22 (1854).
Monasa leucops, Bp. Consp. Vol. Zyg. p. 13 (1854).
Monasa personata, Scl. P. Z. S. 1855, p. 196.
Monasa leucops, Burm. Syst. Ueb. ii. p. 293 (1856).
Monasa leucops, Pelz. Sitz. Ak. Wien, xx. p. 512 (1856).
Monasa morphæus, Cass. Pr. Ac. Sc. Phil. 1860, p. 135.
Monasa morphæus, Scl. Cat. A. B. p. 274 (1862).
Monasa morphea, Cab. et Heine, Mus. Hein. iv. p. 127 (1863).
Monasa leucops, Pelz. Orn. Brasil. p. 22 (1871).
Monasa morpheus, Scl. et Salv. Nomencl. p. 106 (1873).

Nigro-schistacea, in ventre paulo dilutior, in pileo, facie et gutture nigra; remigibus et rectricibus nigricantibus, his æneo paulum tinctis; fronte et loris cum gulâ summâ albis; subalaribus et remigum marginibus internis albicanti-cinereis; rostro ruberrimo, pedibus fusciscenti-nigris: long. tota 11·5, alæ 5·1, caudæ rectr. med. 5·2, ext. 4·6, rostri a rictu 1·5. *Fem.* mari similis.

Hab. in Brasiliæ orientalis regione sylvaticâ et in Amazoniâ inferiore.

Soon after this species first became known in Europe, some sixty years ago, four different names were assigned to it by four different naturalists. Of these, as was first pointed out by Cassin, the earliest in date seems to be "*morpheus*," adopted from Wagler's MS., and published by Hahn

and Küster in 1822. These authors wrote their specific term "*morphoeus*;" but there can be little doubt, I suppose, that they intended to bestow upon the bird the familiar name of the classical god of sleep and dreams "*Morpheus*." It seems therefore best to consider the specific term a substantive and to put it in apposition with the generic one, though Messrs. Cabanis and Heine have proposed to convert it into an adjective, and to alter its termination.

The White-faced Nunbird is a well-known inhabitant of the great wood-region of South-eastern Brazil, and has been noticed by nearly all the explorers of that district. Prince Maximilian of Neuwied found it in the forests of the Rio Espirito Santo and Belmonte. Professor Burmeister did not himself see the bird, but obtained specimens from his hunters in the vicinity of New Freiburg, in Minas Geraes: Spix met with it in the province of Piahy; and Natterer obtained examples near Rio di Janeiro and on the Rio Claro near Goiaz. Prince Maximilian gives us the following notes on its habits:—

"This fine *Tamatia* I did not meet with so often as the preceding species (*Malacoptila torquata*). It does not live so near human habitations, but is found in the vast thickly wooded districts, where we obtained many specimens. In the summer they live in pairs, in the cold season singly or in flocks. At times pouring forth their loud and peculiar cries from the thick branches close to us, they astonished us not a little. They are somewhat less stupid and solitary in their habits than *M. torquata*. I have often seen them, more especially when uttering their loud cries in concert. In their stomachs I have found remains of insects. About their nesting-habits I can give no information."

This species, or a very closely allied form, inhabits the forests of Lower Amazonia. Wallace obtained it in the vicinity of Para, and Natterer at Borba and on the Rio Içanna, a branch of the Rio Negro. Although referable to *M. morpheus*, one of Mr. Wallace's specimens in my collection certainly shows less white on the throat, and thus diverges towards *M. peruana*, which takes the place of *M. morpheus* in Upper Amazonia.

Natterer describes the iris of this bird as dark brown in life, the feet and claws as greyish black, and the bill bright cinnabar with an admixture of carmine.

The examples of this species in my collection and that of Messrs. Salvin and Godman measure as follows:—

No.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	P. L. S.	S.E. Brazil.	11·5	5·1	5·2	1·5
2.	S.-G.	Bahia (<i>Wucherer</i>).	10·3	5·2	5·1	1·6
3.	S.-G.	Bahia (<i>Wucherer</i>).	10·5	4·8	4·9	1·5
4.	S.-G.	Bahia (<i>Wucherer</i>).	10·0	4·8	4·7	1·3
5.	P. L. S.	Lower Amazons (<i>Wallace</i>).	11·3	5·1	5·0	1·5

The figure (Plate L.) is taken from No. 1.



MONACHA PERUANA.

Hanham del.

MONACHA PERUANA.

THE PERUVIAN WHITE-FACED NUNBIRD.

PLATE LI.

Monasa peruana, Scl. P. Z. S. 1855, p. 194.

Monasa peruana, Scl. P. Z. S. 1857, p. 262.

Monasa peruana, Scl. P. Z. S. 1858, p. 60.

Monasa peruana, Cassin, Pr. Acad. Sc. Phil. 1860, p. 135.

Monasa peruana, Scl. Cat. A. B. p. 275 (1862).

Monasa peruana, Cab. et Hein. Mus. Hein. iv. p. 128 (1863).

Monasa peruana, Scl. et Salv. P. Z. S. 1866, p. 192.

Monasa peruana, Scl. et Salv. P. Z. S. 1867, p. 752.

Monasa peruana, Scl. et Salv. Nomencl. p. 106 (1873).

Monasa peruana, Scl. et Salv. P. Z. S. 1873, p. 295.

Monasa peruana, Tacz. P. Z. S. 1874, p. 548.

Nigro-schistacea, in ventre vix dilutior, in pileo, facie et gutture ferè nigra; remigibus et rectricibus nigris; fronte angustâ et mento summo albis; subalaribus et remigum marginibus internis cinereis; rostro ruberrimo, pedibus virescenti-nigris: long. tota 11·3, alæ 5·1, caudæ 5·0, rostri a rictu 1·5. *Fem.* mari similis.

Hab. in Amazoniâ superiore.

Obs. Species a *M. morpheo* gulâ summâ solum albâ et fronte angustiore albâ, necnon crassitie paulo minore diversa.

It was not without some misgivings that I described this bird in 1855 under a MS. name given to it by Bonaparte and Verreaux, and placed upon the labels of skins in the collection of Verreaux frères, at that period the leading house in Europe for the purchase and sale of specimens of natural history. It is not entirely without misgiving that I now continue to accord it rank as a separate species—the characters that divide it from *M. morpheus* being certainly of not very great weight. Still I am unwilling to unite two forms which have long stood apart, and have been generally recognized as distinct, especially when they inhabit districts that are in many other cases tenanted by different representative species.

The Peruvian White-faced Nunbird seems to be an abundant and generally distributed species in Upper Amazonia, and has been obtained by most of the well-known collectors who have visited that district. Hauxwell met with it at Chamicuros, on the Ucayali; E. Bartlett at the same place, as also at Sarayacu and Chyavetas, “plentiful in all these localities;” Jelski came across it further westward at Monterico in Central Peru; and Buckley far to the north at Sarayacu in Ecuador.

I have never seen specimens of this bird in “Bogotá” collections, or from any part of

Colombia, where the very distinct *M. pallescens* seems to take its place. North of Panama we enter the area of the closely allied form *M. grandior*.

Comparing together a series of this species and *M. morpheus*, we at once notice that the extent of white on the throat, though slightly variable in amount, is always much smaller in the present bird, only occupying just the summit of the chin under the rami of the lower mandible. The white front is also rather narrower, and the size, as will be seen by the admeasurements, rather smaller.

The Peruvian White-faced Nunbird is represented by the following series in my collection and that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Upper Amazons.	10·8	4·9	4·4	1·5
2.	—	S.-G.	Ega, Upper Amazons.	9·8	4·6	4·4	1·2
3.	—	P. L. S.	Chamicuros, Peru (<i>Bartlett</i>).	10·2	4·8	4·5	1·5
4.	—	P. L. S.	Chamicuros, Peru (<i>Bartlett</i>).	10·3	4·8	4·5	1·5
5.	—	P. L. S.	Sarayacu, Ecuador (<i>Buckley</i>).	8·8	4·7	4·3	1·3
6.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	9·0	4·9	4·5	1·5
7.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	9·0	4·8	4·5	1·4

The figure (Plate LI.) is taken from No. 3.



MONACHA GRANDIOR.

MONACHA GRANDIOR.

THE LARGER WHITE-FACED NUNBIRD.

PLATE LII.

Monasa grandior, Scl. et Salv. P. Z. S. 1868, p. 327.

Monasa peruana, Lawr. Ann. L. N. Y. ix. p. 118 (1870).

Monasa grandior, Salvin, Ibis, 1872, p. 322.

Monasa grandior, Scl. et Salv. Nomencl. p. 106 (1873).

Nigro-schistacea, in ventre vix dilutior; capite toto atro; remigibus et rectricibus nigris; fronte angustâ et gulâ summâ albis; subalaribus et remigum marginibus internis cinereis; rostro ruberrimo; pedibus fusciscenti-nigris: long. tota 11·7, alæ 5·8, caudæ 5·0, rostri a rictu 1·6. *Fem.* mari similis.

Hab. in Americâ centrali, Costaricâ, Nicaraguâ et Mosquitâ.

Obs. Affinissima *M. morpheo*, et, nisi ob crassitiem majorem et capitis colorem magis nigrum, vix separanda.

I BECAME aware of the existence of a species of White-faced Nunbird in Central America some years ago from some drawings of the birds of the territory of the Mosquito Indians made by a Mr. Bell. In 1868 the first specimen arrived in this country, in a collection from Costa Rica forwarded to Messrs. Salvin and Godman by Mr. Carmiol, and was shortly afterwards exhibited and described before the Zoological Society of London by Mr. Salvin and myself, and named "*grandior*" from its comparatively large size. After pointing out the characters which distinguish it from *M. morpheus* of Brazil, we remarked that, the intermediate territory between these two near allies being occupied by two other species (*M. pallescens* and *M. peruana*), we had deemed it advisable to give this form also a name, although the points of difference were but slight.

More recently Messrs. Salvin and Godman have acquired further specimens of this species among the birds collected by the late distinguished naturalist Mr. Thomas Belt near the Chontales mines in Nicaragua.

The only reference I can find of other writers to this Nunbird is in Mr. Lawrence's list of Costarican birds published in 1870 in the 'Annals of the Lyceum of Natural History of New York.' There can be no doubt that the examples met with by Mr. J. Cooper at San Carlos, San José, Pacnare, and Payra in Costa Rica, will be found to belong to this form, and not to *M. peruana* as determined by Mr. Lawrence, who comments upon their larger size.

It will be observed in the figure of this species that the little patch of feathers at the base of the lower mandible on each side is coloured black, and not white. But this does not seem to

be an absolutely distinctive character as I at first supposed; for upon close examination I find that it also occurs in some examples of *M. morpheus* and *M. peruana*.

The four examples of *Monacha grandior* in the collection of Messrs. Salvin and Godman measure as follows:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♀	S.-G.	Costa Rica (<i>Carmioli</i>).	11·7	5·8	5·3	1·6
2.	—	S.-G.	Costa Rica (<i>Carmioli</i>).	11·3	5·3	5·1	1·6
3.	—	S.-G.	Chontales, Nicaragua (<i>Belt</i>).	11·8	5·5	5·0	1·7
4.	—	S.-G.	Chontales, Nicaragua.	11·0	5·5	5·8	1·6

The figure (Plate LII.) is taken from No. 1.



J. G. Keulemans. del.

MONACHA PALLESCENS

Hartnagel imp.

MONACHA PALLESCENS.

THE PALE NUNBIRD.

PLATE LIII.

Monasa pallescens, Cassin, Pr. Acad. Sc. Phil. 1860, p. 134.

Monasa pallescens, Cassin, ibid. 1864, p. 287, t. iv.

Monasa pallescens, Wyatt, Ibis, 1871, pp. 130, 374.

Monasa pallescens, Scl. et Salv. Nomencl. p. 106 (1873).

Monasa pallescens, Scl. et Salv. P. Z. S. 1879, p. 536.

Cinerea, capite et gutture toto in nigrum transeuntibus; remigibus et rectricibus nigris, extùs æneo lavatis; fronte angustâ albâ; subalaribus et remigum marginibus internis cinereis; rostro ruberrimo; pedibus nigris: long. tota 11·1, alæ 5·2, caudæ 4·7, rostri a rictu 1·9. *Fem.* mari similis, sed crassitie paulò major.

Hab. in Columbiâ boreali-occidentali.

THE black throat at once distinguishes this bird from *M. morpheus* and its two slightly modified allies, which we have just treated of, and renders it a well-marked species. But the singular point in its history is that, exactly contrary to the usual state of things in such cases, it occupies an area lying between two of its representatives, which are much more closely allied to each other than to it. There can be no question that *M. grandior* comes much nearer to *M. peruana* than to *M. pallescens*; yet we find *M. pallescens* situated geographically between them. This constitutes a rare exception to the ordinary rule of the distribution of organized beings.

M. pallescens was first described by Cassin, in 1860, from specimens obtained by Mr. Charles J. Wood and Mr. W. S. Wood, jun., of Philadelphia, who accompanied Lieut. Michler in the survey of the Isthmus of Darien made by order of the U.S. Government in 1858. The route taken by Lieut. Michler's party was up the Atrato river and its tributaries the Truando and Nercua. On the Truando, in the month of January 1858, a party of eight or ten specimens of the present bird was observed "sitting very quietly in a tree at some distance from the ground; and being quite regardless of the gun or of the presence of man, several were obtained."

Mr. Cassin informs us that the skins labelled as females were slightly larger than those stated to be males, and that the specimens were deposited partly in the U.S. National Museum and partly in the Museum of the Academy of Natural Sciences of Philadelphia.

Mr. Cassin lays much stress on the "cinereous colour" of this species "on the body above and below and on the wing-coverts, which colour is very light and in some specimens nearly white on the whole of the upper wing-coverts, and but slightly darker on the under wing-coverts." The figure given in a subsequent volume of the Academy's 'Proceedings' also shows this peculiarity (which led to the selection of its specific name) very definitely. But the six

specimens before me do not present this feature so strongly as one would expect from Mr. Cassin's description and figure, although *M. pallescens* is certainly of a lighter shade on the wing-coverts than any of the allied species.

More recently two other naturalists have encountered *M. pallescens* in its native wilds. Mr. C. W. Wyatt obtained a single example in 1870, during his excursion into the Magdalena valley, "on the Lake of Paturia in the dense forests." On the opposite side of the Magdalena Mr. T. K. Salmon met with it at several of his collecting-localities in the State of Antioquia in 1872 and the following years, and supplied us with excellent specimens.

The species also ranges sufficiently far south to be occasionally present in "Bogotá" collections. Skins of the unmistakable "make" of this district are in my collection and in that of Messrs. Salvin and Godman, as will be seen by the subjoined list of those now before me:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Medellin, Colombia (<i>Salmon</i>).	11·1	5·2	4·7	1·9
2.	♂	S.-G.	Remedios, Colombia (<i>Salmon</i>).	11·0	5·3	4·6	1·7
3.	♀	S.-G.	Remedios, Colombia (<i>Salmon</i>).	11·3	5·5	5·3	1·8
4.	♂	P. L. S.	Magdalena valley (<i>Wyatt</i>).	10·7	5·7	5·2	1·7
5.	—	P. L. S.	Columbia interior (Bogotá).	10·6	5·7	4·8	1·7
6.	—	S.-G.	Columbia interior (Bogotá).	9·2	5·3	5·2	1·6

The figure (Plate LIII.) is taken from No. 1.



Le Kermadec 1874

Hanhart. imp

MONACHA NIGRIFRONS

MONACHA NIGRIFRONS.

THE BLACK-FRONTED NUNBIRD.

PLATE LIV.

Bucco nigrifrons, Spix, Av. Bras. i. p. 53, t. 43. fig. 2 (1824).

Lypornix unicolor, Wagl. Syst. Av. *Lypornix*, sp. 2 (1827).

Monasa nigrifrons, Gray et Mitch. Gen. B. i. p. 74 (1846).

Monasa nigrifrons, Gray, List of Fiss. B. M. p. 49 (1848).

Monasa nigrifrons, Bp. Consp. i. p. 147 (1850).

Monasa nigrifrons, Scl. Ann. N. H. ser. 2, xiii. p. 481 (1854).

Monasa nigrifrons, Scl. Syn. Bucc. p. 22 (1854).

Monasa nigrifrons, Bp. Consp. Vol. Zyg. p. 13 (1854).

Monasa nigrifrons, Scl. P. Z. S. 1855, p. 196.

Monasa nigrifrons, Burm. Syst. Ueb. ii. p. 294 (1856).

Monasa nigrifrons, Pelz. Sitz. Ak. Wien, xx. p. 511 (1856).

Monasa nigrifrons, Scl. P. Z. S. 1858, p. 60.

Monasa nigrifrons, Cass. Pr. Ac. Sc. Phil. 1860, p. 135.

Monasa nigrifrons, Scl. Cat. A. B. p. 274 (1862).

Monasa nigrifrons, Cab. et Hein. Mus. Hein. iv. p. 127 (1863).

Monasa nigrifrons, Scl. et Salv. P. Z. S. 1866, p. 192.

Monasa nigrifrons, Scl. et Salv. P. Z. S. 1867, pp. 583, 978.

Monasa nigrifrons, Pelz. Orn. Bras. p. 22 (1871).

Monasa nigrifrons, Scl. et Salv. P. Z. S. 1873, p. 295.

Monasa nigrifrons, Scl. et Salv. Nomencl. p. 106 (1873).

Monasa nigrifrons, Scl. et Salv. P. Z. S. 1879, p. 633.

Obscurè cinerea ferè unicolor, in capite et gutture in nigrum transiens; remigibus et rectricibus nigris æneolavatis; rostro ruberrimo, pedibus nigris: long. tota 10·4, alæ 4·11, caudæ 4·10, rostri a rictu 1·5.
Fem. mari similis.

Hab. in Amazoniâ, præcipuè superiore.

SPIX, who discovered this species in the forests of the river Solimoens (Upper Amazons) in 1820, describes it very concisely as “maximus, familiaris, vociferans, immaculatè plumbeo-niger, subtùs nigro-plumbeus, axillis subspinosus,” and tells us that it is there well known as the “Perú do Mato,” or “Dog of the Wood.” More recent explorers have supplied the cabinets of Europe with numerous specimens from the same district. Hauxwell got it at Pebas, Edward Bartlett at Nauta and Sarayacu, and Whitely at Yquitos. From Peru *M. nigrifrons*

extends northwards into Eastern Ecuador, where Buckley obtained specimens at Sarayacu on the Bobanasa, and southward into Bolivia, where the late Prof. Behn of Kiel procured specimens in the provinces of Chiquitos and Santa Cruz.

Natterer collected a series of no less than eighteen examples of this Nunbird during his journey from South-eastern Brazil to Para. Herr von Pelzeln gives us the following list of the localities:—Goyabeira and Taquaral, in the province of Goiaz; Cuyaba; Villa Maria on the Upper Paraguay, and Caiçara in the same district; Borba on the Madeira; Barcellos on the Rio Negro; and Cajutuba, near Para. About the last-named place there seems to have been some doubt; but the species unquestionably occurs in Lower Amazonia, as I have a skin obtained by Mr. Wallace on the Tocantins river in September 1848.

Herr v. Pelzeln describes a very young Nunbird, obtained by Natterer at Caiçara, as of a dirty slate-colour, here and there passing almost imperceptibly into rufous; the throat much mixed with rusty red. There is a specimen in just such a plumage in the Jardin des Plantes at Paris, procured on the Upper Amazons by Castelnau and Deville. Herr von Pelzeln moreover gives us the following notes of Natterer upon this bird, taken at Goyabeira in the month of July. "Found in high trees in the dense forest, but not on the tops; sits quiet until it sees an insect, which it captures flying. There were six in a flock, of which I shot four. In the stomach I found grasshoppers and beetles. They feed also rather near the ground. They have a loud piping cry."

I add a list of the specimens of *M. nigrifrons* in my collection and that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	Rio Tocantins (<i>Wallace</i>).	10·8	5·0	5·0	1·6
2.	♀	S.-G.	Pebas (<i>Hauxwell</i>).	11·0	4·11	4·7	1·6
3.	♂	P. L. S.	Yquitos, Peru (<i>Whitely</i>).	10·4	4·11	4·8	1·5
4.	♀	P. L. S.	Yquitos, Peru (<i>Whitely</i>).	10·7	5·0	5·1	1·7
5.	♀	S.-G.	Yquitos, Peru (<i>Whitely</i>).	11·2	5·0	5·0	1·6
6.	♂	S.-G.	Yquitos, Peru (<i>Whitely</i>).	9·3	4·9	4·7	1·6
7.	—	P. L. S.	Sarayacu, Ecuador (<i>Buckley</i>).	10·2	4·8	4·7	1·4
8.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	9·7	5·0	4·8	1·5
9.	—	S.-G.	Sarayacu, Ecuador (<i>Buckley</i>).	9·3	4·8	4·7	1·5
10.	—	P. L. S.	Bolivia (<i>Behn</i>).	10·7	4·8	5·0	1·5

The figure (Plate LIV.) is taken from No. 3.



1. CHELIDOPTERA TENEBROSA
2 CHELIDOPTERA BRASILIENSIS.

CHELIDOPTERA TENEBROSA.

THE SMALLER SWALLOW-WING.

PLATE LV. FIG. 1.

- Le petit Coucou noir de Cayenne*, Buff. Hist. Nat. Ois. vi. p. 417 (1779).
Cuculus tenebrosus, Pallas, Neue Nord. Beytr. iii. p. 3 (1782).
Petit Coucou noir de Cayenne, Daub. Pl. Enl. 505 (1783).
Cuculus tenebrosus, Gm. S. N. i. p. 417 (1788).
Cuculus tenebrosus, Lath. Ind. Orn. i. p. 221 (1790).
Le Barbacou à croupion blanc, Le Vaill. Ois de Par. ii. p. 105, t. 46 (1806).
Monasa tenebrosa, Vieill. Nouv. Dict. xxi. p. 321 (1818).
White-rumped Black Cuckow, Lath. Gen. Hist. iii. p. 324 (1822).
Monasa tenebrosa, Vieill. Enc. Méth. p. 1339 (1823).
Monasa tenebrio, Temm. Pl. Col. 323. fig. 1 (1825).
Lypornix tenebrosa, Wagl. Syst. Av. *Lypornix*, p. 7 (1827).
Monasa tenebrosa, Less. Trait. d'Orn. p. 157 (1831).
Chelidoptera tenebrosa, Gould, P. Z. S. 1836, p. 81.
Chelidoptera tenebrosa, Gray et Mitch. Gen. B. i. p. 75 (1846).
Chelidoptera tenebrosa, Cab. in Schomb. Guian. iii. p. 720 (1848).
Chelidoptera tenebrosa, Gray, List of Fiss. B. M. p. 50 (1848).
Chelidoptera tenebrosa, Bp. Consp. i. p. 148 (1850).
Chelidoptera albipennis, Bp. Journ. f. Orn. 1853, p. 47.
Chelidoptera tenebrosa, Scl. Ann. N. H. ser. 2, xiii. p. 482, et
Chelidoptera albipennis, Scl. ibid. p. 483 (1854).
Chelidoptera tenebrosa, Scl. Syn. Bucc. p. 23, et
Chelidoptera albipennis, Scl. ibid. p. 24, t. iv. (1854).
Chelidoptera tenebrosa, Scl. P. Z. S. 1855, pp. 136, 196.
Chelidoptera tenebrosa, Pelz. Sitz. Ak. Wien, xx. p. 513 (1856).
Chelidoptera tenebrosa, Scl. Cat. A. B. p. 275 (1862).
Chelidoptera tenebrosa, Cab. et Hein. Mus. Hein. iv. p. 124, et
Chelidoptera albipennis, Cab. et Hein. ibid. (1863).
Chelidoptera tenebrosa, Scl. et Salv. P. Z. S. 1866, p. 192.
Chelidoptera tenebrosa, Scl. et Salv. P. Z. S. 1867, pp. 583, 752.
Chelidoptera tenebrosa, Scl. et Salv. P. Z. S. 1870, p. 781.
Chelidoptera tenebrosa, Pelz. Orn. Bras. p. 23 (1871).
Chelidoptera tenebrosa, Scl. et Salv. Nomencl. p. 106 (1873).
Chelidoptera tenebrosa, Scl. et Salv. P. Z. S. 1873, pp. 186, 295.
- SCL. Jac. & Puffb. No. XXII.—*May*, 1882.

Suprà æneo-nigra; dorso postico albo; subtùs dorso concolor; in ventre superiore in cineraceum transiens; ventre inferiore castaneo; crisso et subalaribus albis; rostro nigro, pedibus fuscescenti-nigris: long. tota 5·7, alæ 4·0, caudæ 1·9, rostri a rictu 0·9. *Fem.* mari similis.

Hab. in Guianâ, Venezuelâ, Columbiâ interiore, et Amazoniâ totâ.

THE last and most aberrant member of the family of Puff-birds, for which Gould proposed the generic name *Chelidoptera* in 1836, is at once recognizable by its long Swallow-like wings and short squared tail, not to mention its compressed beak and other characters. Two forms of this bird are found in South America, which, although very closely allied in every essential point, may be fairly distinguished as representative species. We will commence with the most long-known and widely distributed form.

The "Smaller Swallow-wing" (as I propose to call this bird in English), although not included by Linnæus in the latest edition of the 'Systema Naturæ, was made known to us shortly after the publication of that work in the writings of Buffon and Pallas. Both these naturalists, as well as Latham and Gmelin, considered our species a Cuckoo; but in 1806 it was correctly transferred by Le Vaillant to the family to which it undoubtedly belongs.

The older writers received their specimens of this species from Cayenne and Surinam, and Temminck, who figured it in 1825 as "*Monasa tenebrio*," says that it is found in every part of Guiana. Schomburgk, speaking of British Guiana, says that although the bird is so common he could never find its nest. "It sits (like *Monasa atra*) high, and usually on the outer branches of the trees."

From Guiana the present bird extends into Venezuela and over nearly every part of Amazonia that has been visited by naturalists. Goering obtained it to the south-east of Merida in Venezuela, Wallace at Para and on the Rio Negro, "abundant" in both localities, and Bartlett, Whitely, and Hauxwell at various stations on the rivers of Upper Amazonia.

Mr. Edward Bartlett tells us (P. Z. S. 1873, p. 295) that the Swallow-wing "breeds in holes in the banks, about two feet deep, and lays two beautifully polished white eggs, very much like those of the Kingfisher in shape and appearance." One of the eggs obtained by Mr. Bartlett on the Ucayali on the 18th of September 1865 is just such as he describes, of a pure and shining white, measuring 0·95 in. by 0·75. It is figured in the accompanying Plate, and is the only egg of any member of this family that I have ever seen.

In the 'Journal für Ornithologie' for 1853 Bonaparte described a supposed new species of this genus from Cumana in Venezuela, as *Chelidoptera albipennis*; and in my 'Synopsis of the Bucconidæ' I gave a figure of the typical specimen in the French national Museum, at the same time expressing some doubts as to the validity of the species. A subsequent examination of the type confirmed those doubts; and I have little hesitation in pronouncing *Chelidoptera albipennis* to be merely an example of the present species with incipient albinism.

I subjoin a list of the representatives of this species in my collection and that of Messrs. Salvin and Godman, with their localities and dimensions:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	♀	S.-G.	Merida, Venez. (<i>Goering</i>).	6·2	4·1	2·0	0·9
2.	—	P. L. S.	Trinidad (?).	5·9	3·8	2·0	0·8
3.	♀	P. L. S.	Bartica Grove, B. Guiana (<i>Whitely</i>).	5·8	4·1	2·0	0·9
4.	♀	S.-G.	Bartica Grove, B. Guiana (<i>Whitely</i>).	5·8	4·2	2·0	0·9
5.	♂	S.-G.	Bartica Grove, B. Guiana (<i>Whitely</i>).	5·8	4·1	2·0	0·9
6.	—	P. L. S.	Maroni river, Surinam (<i>C. Bartlett</i>).	5·8	4·2	1·9	0·9
7.	—	P. L. S.	Cayenne.	5·7	4·0	1·9	0·9
8.	—	S.-G.	Cayenne.	5·9	4·3	2·0	0·95
9.	♀	S.-G.	Oyapok, Cayenne (<i>Jelski</i>).	5·9	4·2	2·0	0·9
10.	—	P. L. S.	Para (<i>Wallace</i>).	6·1	4·1	1·9	0·95
11.	—	S.-G.	Rio Negro (<i>Wallace</i>).	6·0	4·0	2·0	0·9
12.	—	P. L. S.	Yquitos, Peru (<i>Whitely</i>).	6·5	4·5	2·3	1·0
13.	—	P. L. S.	Yquitos, Peru (<i>Whitely</i>).	6·0	4·4	2·1	0·9
14.	—	P. L. S.	Yurimaguas, Peru (<i>E. Bartlett</i>).	6·2	4·2	2·1	0·9
15.	♀	P. L. S.	Xeberos, Peru (<i>E. Bartlett</i>).	6·3	4·5	2·3	0·9
16.	♂	S.-G.	Xeberos, Peru (<i>E. Bartlett</i>).	6·3	4·3	2·2	0·95

The figure (Plate LV. fig. 1) is taken from No. 7.

CHELIDOPTERA BRASILIENSIS.

THE LARGER SWALLOW-WING.

PLATE LV. FIG. 2.

Bucco tenebrosus, Licht. Verz. d. Doubl. p. 8 (1823).

Capito tenebrosus, Max. Beitr. iv. p. 372 (1832).

Brachypetes tenebrosa, Swains. Class. B. ii. p. 334 (1837).

Lyppornix tenebrosa, Swains. B. of Brazil, t. 36 (1841).

Monasa tenebrosa, Burm. Syst. Ueb. ii. p. 294 (1856).

Chelidoptera brasiliensis, Scl. Cat. A. B. p. 275 (1862).

Chelidoptera brasiliensis, Cab. et Heine, Mus. Hein. iv. p. 125 (1863).

Chelidoptera brasiliensis, Scl. et Salv. Nomencl. p. 106 (1873).

Suprà nigra; dorso postico albo; subtùs dorso concolor, in ventre superiore cineraceus; ventre inferiore ochraceo-castaneo; crisso et subalaribus albis; rostro nigro; pedibus fuscescenti-nigris: long. tota 7·6, alæ 4·5, caudæ 2·3, rostri a rictu 1·0. *Fem.* mari similis.

Hab. in Brasiliæ meridionali-orientalis regione sylvaticâ.

Obs. Species *C. tenebrosæ* similis, sed crassitie majore, pectore magis cineraceo, et ventre imo magis ochraceo distinguenda.

THE Brazilian or Larger Swallow-wing remained undivided from the Amazonian form until 1862, when I separated it in my 'Catalogue of American Birds' under the title "*brasiliensis*," giving the principal distinctive characters in a footnote. These, as it will be seen, are not very strong, and on the other side of the Atlantic, I suspect, would only serve to give it rank under a trinomial appellation. It is obvious that the purely forest-haunting species of the wood-region of South-eastern Brazil are cut off from mixing with their representatives in the great Amazonian wood-region by the intervening Sertoes or treeless district, as effectually almost as if surrounded by water. It is, therefore, only in accordance with natural laws that they should acquire distinctive characters; and this we find to be the case in most instances. Whether these characters are such as should be indicated by a binomial or trinomial appellation is merely a question of amount.

"This bird," says Prince Maximilian of Neuwied, in his excellent 'Beiträge zur Naturgeschichte der Vögel Brasiliens,' "is not rare in most provinces of South Brazil, and very common in many of them. It is found in certain spots sitting still and immovable upon the high isolated branches of the forest-trees. From time to time it flies after an insect into the air, and falls back again to its place like a true *Muscicapa*."

"It is a stupid, still, melancholy bird, but likes to sit high, not low and near the ground, like the other *Tamatias*. As in form and colour it rather resembles a Swallow, the Brazilians

call it *Andurinha do mato*, or Wood-Swallow. The resemblance is greatest when the bird sits upon the ground; for its feet are little adapted for walking, and it consequently shuffles along as a Swallow does under similar circumstances.

"Its flight is light and undulating. Sitting upon a high point where it can overlook the neighbourhood, it often emits a short call-note.

"It is any thing but timid, and very easy to shoot. It is usually found where the woods are varied with open country, on the edges of the woods, but likewise in the interior of them. The food of these birds consists of insects, of which I have found the remains in their stomachs. On the Rio Grande del Belmonte I observed how these birds nest. In the month of August I saw them enter a round hole in a perpendicular sandbank on the river, like a Kingfisher's. After digging about two feet in a horizontal direction, we found two milk-white eggs upon a slight lining of a few feathers."

Professor Burmeister, who likewise found this bird a common species in the Brazilian wood-region, tells us that the stomach is thick-walled and fleshy, with an inner leathery lining, and that the cæca are long. In the stomach he found, amongst other insects, ants and a large bug (*Anisosceles*).

The following is a list of the skins of *Chelidoptera brasiliensis* in my collection and that of Messrs. Salvin and Godman:—

No.	Sex.	Mus.	Patria.	Long. tota,	alæ,	caudæ,	rostri.
1.	—	P. L. S.	S.E. Brazil.	7·6	4·5	2·3	1·0
2.	—	P. L. S.	S.E. Brazil.	6·4	4·4	2·4	0·95
3.	—	P. L. S.	Pernambuco (<i>Forbes</i>).	6·3	4·2	2·2	0·9
4.	—	S.-G.	Bahia (<i>Wucherer</i>).	5·8	4·3	2·3	0·95
5.	—	S.-G.	Minas Geraes (<i>Rogers</i>).	7·2	4·5	2·4	1·0

The figure (Plate LV. fig. 2) is taken from No. 1.

INDEX OF SPECIFIC NAMES

ADOPTED AND REFERRED TO.

- Alcedo aurea*, 57, 58.
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 — *maculata*, 99.
 — *paradisea*, 1, 2.
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2.1880.

PART I.]

[OCTOBER, 1879.

A MONOGRAPH
OF THE
JACAMARS AND PUFF-BIRDS,
OR
FAMILIES *GALBULIDÆ* AND *BUCCONIDÆ*.

BY
P. L. SCLATER, M.A., PH.D., F.R.S., &c.,
SECRETARY TO THE ZOOLOGICAL SOCIETY OF LONDON.

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PART II.]

[JANUARY, 1880.]

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PART III.]

[MAY, 1880.]

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PART IV.]

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PART VI.]

[NOVEMBER, 1881.]

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PART VII.]

[JULY, 1882.

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